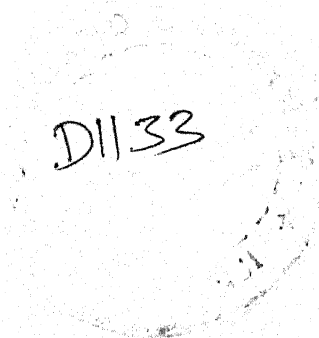


**HEALTH STATUS OF PRIMARY
SCHOOL CHILDREN IN AN URBAN
AREA OF JHANSI**

**THESIS
FOR
DOCTOR OF MEDICINE
(Social and Preventive Medicine)**



**BUNDELKHAND UNIVERSITY
JHANSI (U.P.)**

2000

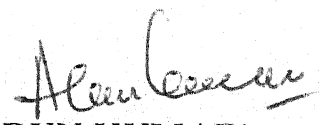
RANJANA SINGH

CERTIFICATE

This is to certify that the research work on the subject "**HEALTH STATUS OF PRIMARY SCHOOL CHILDREN IN AN URBAN AREA OF JHANSI**", has been carried out by **Dr. Ranjana Singh**, under my guidance and supervision.

She has fulfilled the conditions of stay in the department as required by the regulations of Bundelkhand University, Jhansi.

Dated : 17.02.2000


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(Ranjana Singh)

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INTRODUCTION

INTRODUCTION

Modern civilisation demands education on a wide scale and primary education is compulsory in most countries. It is therefore, obligatory for the society to ensure that students are in fit condition of body and mind to receive the education and benefit by it. International declaration of right of the child states, "the child must be given the means requisite for the normal development, materially and morally".

The school age is a formative period, physically as well as mentally, transforming the school child into promising adult. There are two special needs in school years.

- i) health guidance – children are continuously undergoing change-physical, mental, emotional and social. In absence of such guidance, their growth and development may be affected.
- ii) Education in group living –the child plays, travels & learns things with others. He has to adjust and adopts to school environment which is quite different from that at home.

School children form an ideal group to work with. It is captive and a responsive group. About one third of population in every country is of school going children. It is best time to inculcate in them the good habits of healthful living - School children are exposed to the stress, strain and hazards of group life in a school with children coming from different social strata of the community and having different health & community status.

The children must remain healthy to receive the education. Deficiencies in vision, hearing and other handicaps can make learning difficult or may lead to changes in personality and behaviour. The present positions with regard to the health and nutritional status of children in our country is very unsatisfactory. Extensive survey has been carried out in different parts of the country and the findings show that sickness, morbidity and mortality rates of children in India are among the highest in the world (Yajima et al, 1981). Sound nutrition is closely related to progress in education, the poorer the nutrition, the more difficult it is for the child to learn & cope with school life. These defects should therefore, be corrected so that the children may receive their education in normal channel.

The childhood diseases like poliomyelitis, diphtheria, tuberculosis and rheumatism are both killing & crippling diseases and they need to be prevented. Besides congenital defects or abnormalities which may become apparent, other physical or mental method defect should also be detected & corrective measures taken early.

School going children constitute about 21 percent of populations and number of children attending primary school has vastly increased from 2.73 million in 1951 to 14.82 million in 1992. Although about 80 percent of school going children get enrolled but about 49 percent of them drop without completing primary education. However, while 98 percent of boys get enrolled and only 62 percent of girls are enrolled in primary school.

By virtue of their large number, they are entitled to a large share of health care. Nutritional status of children particularly in relation to the possible risk of morbidity and mortality, has been recognised as a field of

major concern. Age group 5-11 years is full of health hazards e.g. diarrhoeal disease malnutrition and infectious disease. A high prevalence of diseases of skin, eye, ear, dental caries and intestinal parasites in this age group is well known.

The school age is one of the crucial period of life as about 40 percent of physical growth and 80 percent of mental growth is believed to take place during this period. School age is a time for acquisition of skills that permits independence in eating and development of likes and dislikes of foods. Individual variation in children becomes more noticeable in the rate of growth, nutrient requirement, personality development and food intake. Development of good food habits and nutritional practice in early childhood establish the foundation for adult health.

It is accepted fact that the school age is a dynamic period of physical growth and development. When the children undergo mental, emotional and social change, the need for health guidance should therefore be maximum during this period. Moreover, the beginning of school life is one of the important phase in the changing environment of a child when he or she leaves home and neighbourhood and exposes himself or herself to a varied intellectual and emotional environment.

The parents are responsible for health of school going children but the school should also assist the parents in building-up and maintaining the highest possible level of health in each child and in developing the necessary competence in each child to deal with health problem in life. The important role of the school is to supplement the efforts of the parents in furthering child health.

The number of destitute children in our country is over the rise due to various social and economic factors. The burden of caring for them falls mainly on the state and organised social sectors. Lack of parental care and denial of a secure family life coupled with living in congested and often unhygienic conditions affects the children adversely. Nutrition and vitamins deficiencies are widespread public health problems among young children of socio-economically backward families in many parts of world, often leading to increase incidence of morbidity.

The school age children by and large constituted, what may be regarded as disciplined population easily accessible for health appraisal and health restoration under an organised health service. An essential pre-requisite for such a service is an authentic information on the existing health and disease status of school going children which can serve as a foundation on which the edifice of a comprehensive school health can be laid.

School health is an important branch of community health. According to modern concepts, school health services is an economical and powerful means of raising community health and more important, in future generations. Although man's attempt to promote health is of ancient vintage, only in recent times has the school been incorporated into the general programme of health promotion. A well-organised school health programme can do a lot in protection and promotion of physical social and mental health of child.

The school health service is a personal health service. It has developed during the past seventy years from the narrow concept of medical examination of children to the present broader concept of comprehensive care of health and well being of children throughout the school years.

Health of school going children can be preserved and improved because most of the defects and diseases that are seen among the school children are preventable. But it can be possible only when the diseases and defects are detected early by well-organised school health programme.

The Bhore Committee (1946) reported that school health services were practically non-existent in India and where they existed, they were in an under developed state. During the five year plans many state Govt have provided for school feeding programme. In spite of these efforts to improve school health, it must be stated that in India, as in other developing countries, the school health services provided are hardly more than a token services because of shortage of resources and insufficient facilities.

School health services have not gained much popularity in this country, probably because of peculiar rural condition, economic reasons, non availability of medical personnel and even a growing number of schools and children without a corresponding increase in a accommodation, transport and health staff. Medical supervision of school children even where it exists is very rudimentary. Progressive municipalities in big cities like Mumbai, Calcutta and Delhi have organised school health services albeit meagre when compared with developed countries.

A child who is physically weak will be mentally weak and can not expected to take full advantage of schooling. Every child has the privilege of the right to develop to the maximum limits of his capacity. It is our responsibility to see that the child is given the best opportunity to do so. School health surveys offer an excellent opportunity to screen a large size of paediatric population with minimum resources. With the above facts in view, a need was felt to carry out a survey of health status of primary school children in various schools of Jhansi city. Based on the health status of primary school children, the present study has been undertaken with the following objectives :-

- 1- To study the magnitude of morbidity pattern of primary school children in urban area.
 - 2- To find out their nutritional status including anthropometric assessment.
 - 3- To find out immunisation status of primary school children.
 - 4- To observe the status of personal hygiene including dental health.
 - 5- To study the school environment, and.
 - 6- To study school health programme including health record, mid-day meal, periodic medical examination, health education, health services, first-aid and emergency care.
-

REVIEW OF LITERATURE

REVIEW OF LITERATURE

In democracy, the individual is responsible for his-own health. Yet a democracy recognizes there are something important in the promotion of health that the individual cannot do for him-self and that government must do for him. There is also something that the individual can do for him-self but that can be done better on a community or cooperative basis. In the complex society of today, no one is totally self-sufficient in dealing with all health conditions that will affect him. To supplement what the individual does in health promotion, official and voluntary health organization have been established on local, state, national and international levels operating both cooperatively and independently. These organization protect and promote the health of all citizens.

Some children have good health. With these youngsters the community problem is that of promoting child health to its highest possible level, maintain the health and then safeguard that high quality of health. This means a continuous program. Some youngsters deviate from the normal and thus, are in need of special attention. Certain disorders are of particular importance during the childhood years and an effective community child health program is directed specifically to these childhood disorders as well as to the promotion of child health.

The school health program has been defined as ".... three interrelated parts namely school health services, health education and healthful school living" (Joint Committee on Health Problem, 1961).

The historical development of healthful school living began in 1829 when William A. Alcott indicated the importance of improving school buildings. In 1937, Herry Barnard published an essay on health conditions found within school buildings. In the same year school hygiene was discussed by Horace Mann in his first report to the Massachusetts Board of Education (Richard M. 1962.)

In 1892 the first public school medical officer was appointed in New York City. The Boston Board of health, in 1894, initiated the first medical inspection of school children. The first school nurse was employed by the New York city schools in 1902. State medical inspections compulsory in its public schools in 1906. (Quoted from the book 'school health program' by Haag JH. 1968).

At the White House conference on care of dependent children, it was proposed that "... every needy child should receive the best medical and surgical attention." School health services were considered at the White House Conference on child welfare in 1920. Vision and hearing testing, health records, control of communicable diseases, dental and nutritional clinics were recommended at the 1920 White House Conference (Quoted from the book 'School Health Program' by Haag JH. 1968).

In 1925, the national congress of parents and teachers promoted the summer round-up campaign. The purpose was "... to promote among parents a realization of their responsibility for sending children to school prepared through adequate medical attention" (Quoted from the book 'School Health Program' by Haag JH. 1968).

The American Association of School Physicians was established in 1927; in 1938 this Society became the American School Health Association.

Daily health inspections, dental care, weighing, immunization and follow through activities of the nurse were some of the phase of school health services (Quoted from the book 'School Health Program' by Haag JH. 1968).

In 1934. "hygiene of the environment" and "school hygiene" were replaced by the term "healthful school living". Difference in desirable and actual conditions of healthful school living were presented at the 1940 White House Conference of children in a democracy. Daily school meals were stressed both for educational and dietary value (Quoted from the book 'School Health Program' by Haag JH. 1968).

The 1940 White House Conference on children and youth recognized the deficiencies in school health services. The delegates proposed the adequate school health services include examination of the teeth, immunization, early detection of disease, through medical examination, vision and hearing tests (Quoted from the book 'School Health Program' by Haag JH. 1968).

In 1947, the American Medical Association inaugurated the series of conferences on children and youth advocated that all school personnel work closely with school health services. This Conferences focused attention on the handicapped child (Quoted from the book 'School Health Program' by Haag JH. 1968).

In 1953 and 1957, two publications of the Joint Committee on health problems in education of the National Education Association and the American Medical Association had considerable impact on school health services. (Joint Committee on health problem, 1961). The two publication were school health services and health Appraisal of school children.

The 1960 white conference on children and youth dealt extensively with school health services. Some of the problems considered by the delegates were hearing and vision screening, dental and medical examination, tuberculin testing, prevention and control of diseases, health records, immunization, the handicapped child and health service facilities. (Quoted from the book 'School Health Program' by Haag JH. 1968).

HISTORY OF DEVELOPMENT OF SCHOOL HEALTH IN INDIA

The beginning of school health services in India dates back to 1909, when for the first time medical examination of school children was carried out in Baroda city. The Bhore committee (1946) reported that school health services were practically non-existent in India and where they existed, they were in under developed state. According to Health Development And Planning Committee Report school health services began exactly 76 years after the French Government for the 1st time in Europe enacted a law (1833) to make school authorities responsible for the sanitary conditions of school buildings and for the health of children (Athavle, 1959).

Viswanathan (1960) reviewing the development of school health services in India stated that in 1914 the corporation of Bombay city undertook the work of periodical medical inspection of school children. In 1921 a permanent department of school medical inspection was established on the recommendation of the school committee. The personnel employed for the Bombay city scheme consisted of (i) five school medical officer both male and female, (ii) health visitors (iii) school clinic organisers and assistant organizers with duties of medical inspection, correction of defects, school sanitation, control of communicable disease, health education in school (Athavle, 1959).

The need for the mid-day meal in all the school was realised and recommended by the committee (school health committee report-I, Govt of India. The school health committee submitted its report in 1961, which contain many useful recommendation. During the five year plans, many state Government have provided for school health and school feeding programmes (School Health Committee, 1961).

NUTRITIONAL ANTHROPOMETRY

Anthropometric measurement such as height, weight skinfold thickness and mid arm circumference are valuable indicators of nutritional status. If anthropometric measurement are recorded over a period of time, they reflect the patterns of growth and development and how individuals deviate from the average at various ages in body size build & nutritional status. These three main anthropometric measurements have been mostly employed is community field surveys for childhood & where the age is known.

WEIGHT

Malaviya et al (1969) carried out a survey in six basic primary schools where 516 student were examined. It was found that average weight in kg of boys was signifianthy higher than the girls of corresponding age groups. Patodi et al (1977) in a study of health status of school children in some primary schools of indore city, found that males children, weighted more than females for the age group of 5-8 years. But from 9 years onwards till 14 years the females weighted more than the males.

In a study by Dwivedi et al (1978) on health status of primary school children, 6404 students were examined in rural field practice area of Rampur Baghelan and 6734 were examined in Rewa town. It was observed that the average weight of children of areas under study was lesser for respective ages than the weight of Indian children of either sex.

Dhar et al (1979) conducted a study of health status of primary school children in Hazratbal Area (Kashmir) observed that the average weight for age of boys as compared to the ICMR references value exceeded the All India Average upto the age of 10 years, while the Alambagh values were higher upto the age of 9 years as compared to the present study. The weight for age in case of girls as compared with other values showed that the values in the present study exceeded All India Averages upto the age of 9 years and latter All India Averages exceeded the values in the present study.

Sharma et al (1984) in a study on health status of primary school children in urban area, examined 1089 children (625 boys & 464 girls) observed that girls were heavier at 5 & 6 years & 12 years of age while boys were heavier than girls at 7 to 11 years of age. Rao et al (1984) in a study of rural primary school children aged 6-14 years observed that these children weighted less than the children in public school.

Bhasin et al' (1990) in a study of well-to-do school children in Haryana observed that mean weight for boys ranged from 19.13 to 52.80 kg. The increment in weight was 33.67 kg. The range of mean weight in case of girls was 18.12 kg at the age of 5 years to 48.52 kg at the age of 15 years and the increment in weight was 30.4 kg.

Kumar et al (1990) in a study of 5-10 years old children of upper socio-economic status observed that the mean weight increased in children

of both the sexes, from 5-10 years of age. There was no significant difference in the mean weight of boys and girls of any age group, excepting between 5.0-5.5 years, when boys were found to be heavier than the girls ($p < 0.05$). Means of weight, of both boys and girls were equivalent or superior to children of Gwalior (Shrivastava et al 1978) as well as Somalia (Gallo et al, 1980). The boys approached to mean value of Delhi (Rath et al, 1978 and Datta et al, 1982) and Hyderabad (Vijayraghawan et al, 1971).

Renu (1990) in a study of female population observed that income level did not affect the anthropometric measurements but study conducted by Bhasin et al (1990) reported that socio-economic status significantly affected the height and weight of school going children.

Parvathi et al (1991) in a study of tribal school going children in the age range of 6 to 12 years in Kollihills & Pachamali in comparison with North Indian children observed that mean weight of boys & girls of both areas were higher when compared to the ICMR standard, Coimbatore norms & All India standard. The weight deficit ranged between 6 to 16 kg and 4 to 18 kg for girls & boys respectively, when compared with Coimbatore norms.

Sood and Kochar (1993) in a study of school going children of Kangra Valley in Himachal Pradesh observed that mean weight of these children were considerably below the ICMR standards. Their study also reported that family income did not correlate with anthropometric measurements in either sex. Chandna and Sehgal (1994) in a study of school children (7-9 years) from Panipat city covering 102 children (51 boys & 51 girls) observed that the mean weight of boys & girls was significantly lower than ICMR reference value and was significantly higher in boys than girls.

Chatterjee et al (1994) in a study of physical growth pattern for boys from rural west Bengal observed that the maximum increase in body weight (5-6 kg.) were seen between 14 and 15 years of age. All the measurements showed highly significant ($P < 0.001$) positive correlations with age height & weight. Mean weight of Bengalee boys were below the 5th percentile of American standard and between 3rd & 25th percentile for weight of British standard. Mean body weight of Bengalee boys when compared with South Indian boys, Singh and Meenakshi (1969) revealed that South Indian boys were shorter and lighter than the boys of present study. Similarly, boys of low socio-economic group reported by Vijayaraghvan et al (1971) are significantly shorter ($p < 0.001$) and lighter ($p < 0.02-0.001$) than boys of present study of comparable age. Indian boys reported by ICMR (1972) are shorter and lighter than the boys of present study. Now-a-days anthropometry is widely used by physical educators because the physique of an individual greatly influences his/her performance as reported by Nariyama et al (1988) and Parizkova (1979).

Singh et al (1996) observed in a study of school age children of salt-worker in Rajasthan that the increase in the mean weight, with age, was seen in both sexes. Girls were heavier than the boys during the ages 10-15 years, it was due to menarche. Rana et al (1986), Rau et al (1985) and Visweswera Rao (1987) observed in their study that the better growth status has been found associated with early age at menarche. The mean weight of both the sexes in the present study were found to be low in comparison to ICMR Rajasthan reference values at most ages and very low in comparison to WHO (Jelliffe D.B. 1966), NCHS (Nelson WE 1982) and well-to-do Indian Children (ICMR 1990) at all ages.

Balgir et al (1998) in a study of Ashram school children in two districts of Orissa observed that the mean weight of the children aged 6 through 15 years increase with the advancement of age in both sexes. But the sex variation for weight in both districts are not statistically significant. However, for certain age groups like 9, 12, 13 years, these are significant due to the small size of the sample and sample variation. In general girls are lighter in weight than the boys. This pattern is consistent in the present study of Ashram school children in Orissa. Further, the Ashram School children (both sexes) are heavier in all the corresponding age categories than the low income group children of Hyderabad, Andhra Pradesh, (Raghavan et al, 1971) and that of the average Indian school children (ICMR report 1984)

HEIGHT

Malaviya et al (1969) in a study of nutritional status of primary school children revealed that average height of school boys in ages of 4-15 years is higher than the girls. Patodi et al (1977) selected randomly eight primary schools located in Indore city examined 1537 students (983 males and 554 females). Their study revealed that male were taller than females excepting at the age of 14 years. When mean height and weight were compared with ICMR standard (1972) it was observed that in present study children were generally lower in average height and weight.

Dwivedi et al (1978) in a study of health status of primary school children of Rampur Baghelan block of Santa district and also children of primary schools situated in the municipal limit of Rewa town, observed that both male and female children of area under study were shorter in height as compared to the average height of Indian children of either sex for the corresponding ages (ICMR 1972) on an average the male children of Rewa

town were taller than their counterparts in Rampur Baghelan block except in the age group of 11 years.

Dhar et al (1979) conducted a survey covered 845 primary school children in Hazartbal area (Kashmir) observed that the height for age of boys as compared with corresponding values of Indian children (ICMR reference value) as urban locality in Alam Bagh, Lucknow (Koshi et al, 1970) and rural locality of Lucknow, Sarojni Nagar (Malaviya et al 1969) indicates that the values in the present study exceed the All India Averages upto the age of 8 years and thereafter there is little difference. The average value of Alambagh and Sarojni Nagar studies are comparable with the present study, there being negligible difference. The height for age of girls, as compared with the similar values of Indian children (ICMR reference value). Alambagh and Sarojni Nagar also shows similar trends upto the age of 8 years and thereafter lags behind to the average Indian values.

Rao et al (1984) in a study of rural primary school children aged 6-14 years observed that height of these children were shorter when compared with children attending public school. The height of boys was more than girls for same age till 9 years of age and then lagged behind till 13 years of age. Sharma et al (1984) in a study of primary school children in urban area of Meerut city found that the mean height of boys was higher than the girls upto the age of 10 years except at 6,11,12 years when the height of girls crosses over the boys.

Bhasin et al (1990) in a study of well-to-do school children in Haryana observed that the range of mean height of boys extended from 112.68 cm. to 166.17 cm and the total increment in height was 53.49 cm. Haryana well-to-do children were taller than the children in ICMR study (1972) and result were significant ($p < 0.05$) for all ages and for both sexes

except male children in the ages of 13 and 14 years where the result were not significant ($p < 0.05$). Datta Banik et.al. (1973), chang et al (1963) and Provis et al (1955) reported the same finding.

Kumar et al (1990) in a study of 5-10 years old children of upper socio-economic status observed that the height increased both in boys and girls, from 5-10 years of age. The boys were significantly taller than the girls between 5 and 5.5 years ($P < 0.001$) and 7.6-8.0 years of age ($P < 0.05$). Boys from Hyderabad (Vijayarahawan et al, 1971) and those of America (stuart et al 1959, Victor, 1983 and Johnston et al, 1977) were taller at all age groups studied excepting between 9-10 years, when height of Varanasi boys was comparable to Hyderabad (Vijayraghawan et al, 1971) and Guatemalan (Johnston et al, 1977) boys.

Parvathi et al (1991) in a study of tribal school going children aged 6 to 12 years observed that all girls and boys of Kolli hills and Panchamali were shorter when compared to ICMR values, Coimbatore Norms and All India Standards. The girls of all age groups except the six years of age Panchamali were taller than their counterparts of Kolli hills. The deficit ranged between 7 to 28 cm when compared with the norms of coimbatore. The boys of Pachamali were taller than their peers of Kolli hills when compared with the Coimbature norms the deficit ranged between 12-24 Cm.

Sood and Kochar (1993) in a study of health status of school going children of Kangra valley observed that mean height of children were below the ICMR standard. Chandna and Sehgal (1994) in a study of nutritional status of school children (7-9 years) from Panipat city observed that Mean height of boys (115.93 cm.) and girls (114.68 cm.) are significantly lower than ICMR reference value and the recorded value of boys and girls was not significant.

Chatterjee et al (1994) observed in a study of physical growth patterns of school boys from rural west Bengal observed that the height of boys increased during the age of 9-17 years with maximum increase (7.66 cm) being seen between 13 and 14 years of age. Boys of the present study were also superior in body height and body weight by 3.8-11.1 percent and 4.4-39.8 percent respectively to rural boys of Udaipur. Bhandari et al (1972) Gill et al (1968) observed in a study of school children in rural area of Lucknow that boys are inferior in body height and weight by 3.6-12.9 percent and 3.9-42.5 percent respectively to Bengalee boys of this study. Banik et al (1973) and Vijaya Raghuvan et al (1971) reported significantly ($P < 0.001$) higher values of height for boys of Delhi and well to do Indians. Kaul et al (1976) observed significantly ($P < 0.02-0.01$) higher values in body height at 9 and 10 years for boys of Madhya Pradesh as compared to boys of present study. Bangalee boys of the present study were found to be taller than those of the study conducted by Hauspie et al (1980) undertaken in west Bengal between 1952 and 1966. Ghani et al (1971) by 2.8-6.9 percent. Chatterjee et al. (1991) observed that height and weight of girls exceeded the boys. School going children of west Bengal are lighter and shorter than well-to-do Indian, American & British counterparts explained by genetic factor Graham et al (1979) nutritional and socio-economic factors Dugdale et al (1970) and Environmental factors by Balasuriya et al (1986). Visweswar (1987), Udani (1963) and Chang et al (1963) reported that socio-economic and nutritional status play vital roles in determining the growth potential of a child

Singh et al (1996) in a study of school age children of salt-workers in Rajasthan observed that mean height was equal in both the sexes or better during 10-13 years in case of girls. The mean values of height in both boys and girls were slightly lower than the Rajasthan of reference value (ICMR

1972) at most. Means of height of WHO standards (Jelliffe 1966), NCHS (Nelson 1992) and well-to-do Indian children (ICMR 1990) are very high in comparison to values obtained in children studied at all age. Rau et al (1985) and Qamra et al (1990) earlier also reported the same finding.

Balgir et al (1998) in a study of Ashram school children in two district of Orissa observed that height of school children increases with the advancement of age in both sexes. It was also observed that height of school children are not statistically significant. The boys and girls of Mayurbhanj district are comparatively taller than the boys and girls of Sundargarh district of Orissa, but this difference was not statistically significant. However, Ashram school children belonging to all the corresponding age categorise shows lower value for height and weight as compared to well-to-do children of Hyderabad, Andhra Pradesh (Raghvan et al, 1971).

MID ARM CIRCUMFERENCE

Dhar et al (1979) observed that the mid arm circumference values of the present study when compared with the Jelliffe (1966) and the study of Alambagh it reveals that the trend is similar in both the sexes while the value of present study stand at the lowest level, showing very little increase in muscle mass over the years. This difference with respect to other values increase steadily with advancing age, the value of WHO remaining constantly at higher level. This may suggest the presence of protein gap in the dietary intake of these children under study.

Sharma et al (1984) in a study of primary school children in Meerut city observed that their was a gradual increase in mid-arm circumference

with advancing age. Mid arm circumference was higher in girls at all ages except at 7 years where the boys measured more than the girls.

Parvathi et al (1991) in a study of tribal school going children of Kollihills & Pachamalai aged 6-12 years observed that girls and boys of both area had arm circumference less than that of Coimbatore norms & All India standard. Sood and Kochar (1993) in a study of school going children observed that the mean arm circumference value in Utrala males was normal (22.69 ± 2.60 c.m'), whereas rest of the population it was subnormal compared to reported literature values of Jelliffe (1966).

Chandna & Sehgal (1994) in a study of school children (7-9 years) from Panipat city observed that mid arm circumference (MAC) in boys & girls were significantly lower than the reference value. However mid arm circumference were significantly higher in girls than in boys. Higher intake of nutrients by boys might have resulted in better anthropometric measurements in boys than that of girls.

IMMUNIZATION STATUS

Patodi et al (1977) in a study of school children in some primary school of Indore city observed that the immunisation status of the school children was unsatisfactory. 5.01 percent children were found unprotected against small pox and 37.6 percent against tuberculosis, while immunisation against diphtheria, pertusis, tetanus and polio was done in very small number of children and on the whole it was not satisfactory.

Dwivedi et al (1978) in a study of health status of primary school children, 6404 students were examined in rural area of Rampur Baghelan block & 6734 were examined in Rewa town. The vaccination status for

small pox was high among primary school children of rural & urban area. 94.8% children in rural & 91.3% in urban area had small pox vaccination scars, while only 28.7% and 56.2% had BCG vaccination in respective areas. Some of the unprotected children were vaccinated during health survey.

Yaima et al (1981) in a study of morbidity pattern in urban school children observed that out of 990 children studied, 951 (96.0 percent) had small pox vaccination scars, 198 (20.0 percent) children had DPT/DT and 204 (20.6) percent) children had cholera and typhoid inoculations. Taking all type of immunisation into consideration male children formed 73.2 percent to 87.9 percent immunisation. Total no. of children vaccinated against BCG was 20.0 percent.

Sharma et al (1984) in a study of Primary school children in urban area of Meerut observed that small pox & BCG vaccination scars were present in 90.54% and 22.68% cases respectively. Small pox vaccination was almost equal among hindus & muslims but coverage of BCG vaccination was higher among hindus (94.40%) as compared to muslims (88.58%).

PERSONAL HYGIENE

Dhar et al (1979) in a study of primary school children in Hazratbal Area (Kashmir) observed that the overall personal hygiene was unsatisfactory among 454 (53.7 percent) children out of 845 children examined, being more common among boys than girls.

Agarwal et al (1999) in a study of school girls observed that commonest health problems noted in these girls were related to hygiene (62.2 percent) while dental caries were commoner in younger girls, pediculosis was most frequently seen in older girls of secondary section.

IRON DEFICIENCY ANEMIA

Patodi et al. (1977) et al in a study of school children in primary school of Indore city observed that the majority of children suffered from nutritional disorder (27.58 percent) out of which iron deficiency anemia accounts for 6.70 percent of total 1537 children. Shah & Udani (1968) explained that the high incidence of anemia results from one or more factors viz utilization of iron, a low dietary intake of iron & high prevalence of parasitism. Dwivedi et al (1978) in a study of Primary school children in rural & urban area observed that anemia was present in 11.38 percent of school children.

Dhar et al (1979) in a study of school children in Hazartbal area (Kashmir) observed that average haemoglobin value was lower among girls as compared to boys. The mean haemoglobin values were lower in girls as compared to boys (12.17 ± 0.91 gm% and 11.80 ± 1.01 gm% for boys & girls respectively). The average haemoglobin value for both the sexes was 12.05 ± 0.96 gm%. Koshi et al (1970) found 11.8 gm haemoglobin in primary school children.

Sharma et al (1984) in a study of primary school children in urban area, observed that out of 1089 children hindu children accounts for (79.08 percent), muslims (19.28 percent) and sikhs (1.64 percent). Pallor was seen in 20.56 percent cases with almost equal sex ratio. Muslim children had a

higher prevalence rate (24.28 percent) as compared to hindu (19.95 percent) and sikh (22.22 percent). Prevalence of pallor was reported to be, 49.5% by Indirabai and Malika (1976), in the present study pallor was seen in 20.56 percent cases.

Parvathi and Poorani (1991) observed in a study of nutritional status of tribal school going children that haemoglobin values in all age groups children was less than the standard value which is 12 gm percent, Haemoglobin values of all the 200 children was between 7-9 gm percent.

Sharma et al (1991) observed in a study of children that the maximum prevalence (17.0 percent) was seen in girls of 12-18 years from the state of Andhra Pradesh, while minimum prevalence of less than 2.0 percent was seen in children in Karnataka. In other states, it ranged from 2 to 15 percent.

Sood and Kochar (1993) observed in a study of school going children that the mean values of haemoglobin in male and female subjects ranged from 10.84 - 11.00 and 10.61 - 11.22 g/dl respectively. Following WHO (1972) criterion of Hb level 12 g/dl or more as normal, most of the subjects in the present study could be classified as marginally anaemic. Haemoglobin did not correlate with income or anthropometry in either sex. This result was in agreement with Prasad et al (1987) who found no correlation of Hb value with income or anthropometry.

Chandna and Sehgal (1994) in a study of school children 7-9 years from Panipat city observed that the mean haemoglobin 10.83 ± 1.77 and 9.53 ± 1.50 in boys and girls respectively. Mean intake of iron by boys and girls were significantly lower than recommended daily allowances. Intake of iron by boys and girls was almost similar, less intake of green leafy

vegetables might have lead to inadequate intake of iron. Similarly, less intake of iron & calcium was reported by Chandna & Bhat (1984).

Chhabra et al (1996) in a study of boys 6 to 12 years in a children observation home observed that out of 192 boys included in the study pallor was present in 9 (4.7 percent) boys.

Balgir et al (1998) observed in a study of Ashram school children in two district of Orissa that the school children showed 68 to 75 percent of mild to moderate anemia. These finding are consistent with the study of Gopalan, (1992). It may be due to high prevalence of parasitic infestations and iron, Folic Acid and other nutritional deficiencies and hereditary factors.

NUTRITIONAL DEFICIENCY

(a) *Malnutrition*

Dhingra et al (1977) also reported a higher prevalence of malnutrition (88.1 percent) in ordinary primary schools as against 41 percent among public schools. In the present study malnutrition was noticed in 52.98 percent cases (Grade I - 31.77 percent, grade II - 15.51 percent, Grade III - 5.69 percent and grade IV - 0 percent).

Verma et al (1980) in a study of nutritional profile of children in rural community of Jhansi district observed that about 54 percent children were observed to be normal in respect of height for age and about 6 percent in respect of weight for age. Analysis further indicate that about 74 percent children were undernourished on the basis of weight for height with more than 5 percent being less than 60 percent or below weight of reference standard.

Sharma et al (1984) in a study of primary school children in urban area of Meerut city revealed that malnutrition was noticed in 52.98 percent cases. Grade-I malnutrition was most common (59.96 percent). None of the cases had grade IV malnutrition. Malnutrition was more common among muslims (68.09 percent) as compared to hindu (50.29 percent). Sikh were least effected (16.6 percent).

Karim et al (1991) in a study of effect of nutrition on school performance in Dhaka (Bangladesh), observed that the higher level of performance by the nutritionally normal children compared to the malnourished children, and existence of a relationship between the examination performance and their nutritional status. The average marks obtained by the nutritionally normal children was 62 percent and by malnourished children was 57 percent. The difference is significant at the probability less than 0.025. About 5 percent of the nutritionally normal children obtained less than 40 percent marks compared to 17 percent of the malnourished children and 23 percent of nutritionally normal children obtained 80 percent or more marks compared to 9 percent of malnourished children. The examination performance of the children classified by their weight for age nutritional status as defined by waterlow criteria (1972). Cravioto et al (1973) also reported that an association exists between the nutritional status of children and their educational performance.

Bapat and Aspatwar (1992) observed in a study of school children of Bombay suburbs that the, 6.62 percent of school age children were suffering from protein calorie malnutrition. Higher prevalence of malnutrition among children indicated that food consumed by these children were of poor quality or were inadequate to meet their growing needs.

Chhabra et al (1996) observed in a study of boys aged 6 to 12 years that out of 192 boys, 121 (63 percent), had a normal nutrition status, while 71 (37 percent) were malnourished. Of these, 32 (16.7 percent) had severe malnutrition and 39 (20.3 percent) had mild malnutrition. In the present study, a large number (36.98 percent) of the boys were malnourished. A similar prevalence of malnutrition has been observed by Verma et al (1971) and Gangadharan (1977) conducted in this age group in the under privileged children of rural and urban areas.

Singh, et al (1996) in a study of school children of salt worker in Rajasthan observed that the 31.0 percent boys and 24.7 percent girls showed stunting, which was significantly higher in boys ($P < 0.05$). The overall stunting among the children of salt workers was 27.8 percent. Visweswara et al (1990) in their study observed the same overall stunting. The prevalence of severe wasting in the present study was found significantly ($p < 0.05$) higher in girls (21.9 percent) than the boys (16.0 percent). Prevalence of low (severe) weight for age was almost the same in boys (25.5 percent) and girls (26.8 percent) in the present study. The overall proportion of normal children was 25.5 percent in the present study. The proportion of stunting with severe wasting was 5.6 percent in boys, 3.4 percent in girls indicating a lack of sex-wise difference. But proportion of normal with severe wasting was significantly higher in girls than boys ($p < 0.01$), indicating that the current forms of severe malnutrition were higher in girls than the boys. Visweswara K et al (1990) and Krishna et al (1991) reported in their study that there is sex wise difference in severe forms of recent and long term malnutrition. Datta Banik (1982) reported that the children whose parents educational level and socio-economic status were higher, had height and weights similar to those of American children.

Agarwal et al (1998) in a study of early undernutrition on reaction time of rural children observed that the premotor, motor and total reaction times in undernourished children were significantly prolonged as compared to those having normal nutritional status throughout the study period. The children who were currently in grade III undernutrition had significantly prolonged reaction time (1.01 ± 0.13 m sec) as compared to those having normal Nutrition status (0.92 ± 0.09 m sec). Bhatia et al (1979) observed in a study that nutrition intervention given even during 3-7 years of age is effective in improving cognitive performance. Agarwal et al (1990), Upadhyay et al (1995), Agarwal et al (1995) and Mishra et al (1996) observed in their study that early life malnutrition in children may result in persistent brain functional deficits leading to prolonged reaction time, soft neurological signs, impaired higher mental function and brain MRI changes are of concern. Upadhyay et al (1989) and Agarwal et al (1989) in their study on rural primary school children (6-8 years) on mental function Weschler's modified intelligence scale, Vineland Social maturity, Bender Gestalt-Visual motor coordination, piaget's task and memory demonstrated impaired intelligence, being more marked in those stunted. Agarwal et al (1989) observed that stunted wasted children demonstrated presence of soft neurological signs and electroencephalographic changes. Agarwal et al (1991) in a study of learning disability in rural primary school children observed that even children having IQ > 90 showed impaired perceptual maturity and conceptual grasp.

Agarwal et al (1999) observed in a study of school girls from Mumbai that the nutritional disorder were present in 29.0 percent, undernutrition was commoner in younger girls of primary section, though stunting was more frequently seen in older girls. Gupta (1989) and Thomas (1992) observed in their study that nutritional deficiencies are widely prevalent in

rural and slum children due to poverty, ignorance and high incidence of infections.

Yadav et al (1999) in a study of nutritional status and dietary intake in tribal children of Bihar observed that the about 60 percent of children were stunted (< -2 SD) while 40 percent were severely stunted (< -3 SD). According to weight for age criteria, the overall prevalence of undernutrition (< -2 SD) was about 55 percent. The prevalence of stunting and underweight was comparable in boys and girls. However, wasting was more frequent in girls (urban 4.5 percent Vs 16.3 percent and rural - 34.9 percent Vs 18.0 percent). Krishnaswamy et al (1997) in a study observed that deficiency is much higher among tribal school children

VITAMIN DEFICIENCY

Vitamin 'A'

Malaviya et al (1969) in a study of school children in the rural health training centre observed that the out of 516 students examined 282 i.e. 54.65 percent showed one or the other manifestations of vitamin A deficiency. It may further be observed that the conjunctival xerosis was the most common (28.68 percent out of 516 examined and 52.48 percent of all the vitamin A deficiency manifestation). This was followed by hyperkeratosis of the skin (25.53 percent of all the vitamin A deficiency manifestations), bitot's spot (13.83 percent), corneal xerosis (3.54 percent), night blindness (2.83 percent) and corneal opacity (1.77 percent). Further analysis of the cases of follicular hyperkaratosis of skin revealed that out of 72 cases 33 i.e. 45.83 percent were not associated with ocular manifestation.

Patodi et al (1977) observed in a study of School children in some primary school that out of 1537 students age varied from 5 to 14 years vitamin A deficiency was present in 178 students (11.58 percent). Dwivedi et al (1978) in a study of primary school children in Rampur Baghelan block of Santa district & children from Rewa town observed that vitamin A deficiency was present in 22.54 percent and 21.70 percent respectively.

Sharma et al (1984) conducted a study of health status of primary school children in Meerut city observed that vitamin A deficiency was seen in 24.42 percent cases and was more prevalent in children from lower Socio-economic classes and among children from large sized families. Incidence of xerosis and bitot's spot were 48 percent and 6.19 percent respectively among muslim children which was three times that of hindus. In Hindus it was 16.26% and 2.63 percent respectively. Merchant and Abraham (1975) reported xerosis and bitot's spot as 18.60 percent and 2.9 percent respectively.

Sharma et al (1991) in a study of nutrition, health and psychosocial profile of institutionalized children observed that the high prevalence of bitot's spot (8.5 percent) was seen in boys 6-11 years in Uttar Pradesh and lowest (less than 2 percent) in children of Karnataka. Bapat et al (1992) in a study of nutritional status of school children in slums of Bombay Suburbs observed that vitamin A deficiency was present in 16.86 percent of school children.

Chandna et al (1994) observed in a study of school children (7-9 years) that the serum vitamin A level ($\mu\text{g}\%$) was 14.94 ± 5.88 (6.13) and 13.34 ± 6.10 (7.78) in cases of boys and girls respectively. Serum Vitamin A was significantly lower than the reference value and was almost similar in

boys and girls. Similar result was also reported by Easwaran and Devadas (1984) among school children of Coimbatore.

Chhabra et al (1996) observed in a study of boys aged 6 to 12 years that out of 192 children signs of specific nutritional deficiency were observed in 24 (12.5 percent) boys. Bitot's spot suggestive of vitamin A deficiency were the most commonly seen in 10 (5.2 percent) boys. Agarwal et al (1999) in a study of school girls observed that sign of Vitamin A deficiency were limited to conjunctival Xerosis or bitot's spot and none had night blindness. Vitamin A deficiency was seen in 7.2 percent of total children studied.

Vitamin - B Complex Deficiency

Malaviya et al (1969) in a study of school children observed that there was no deficiency of sign of thiamin in any of the student examined, only 1.93 percent showed riboflavin deficiency. The clinical manifestation observed was cheilosis in 1.16 percent (6 out of 516 student). Cheilosis was observed only among boys. Three boys & three girls i.e a total of 6 (1.16 percent) showed angular stomatitis; cheilosis along with angular stomatitis was observed in two boys. Early deficiency of niacin in the form of papillary hypertrophy of tongue was found in 4.48 percent (i.e. 25 out of 516 students examined.)

Patodi et al (1977) conducted a study of primary school children in Indore city observed that sign of riboflavin deficiency was present in 6.96 percent of students. Sharma et al (1984) observed in a study of health status of primary school children that Vitamin B complex deficiency was seen in 3.48 percent cases with a higher prevalence rate among children from lower

socio-economic group and from large sized families. Whereas Merchant et al (1975) reported vitamin B complex deficiency in 4.6 percent cases.

Sharma et al (1991) observed in a study of institutionalized children that highest prevalence of angular stomatitis (32.0 percent) was seen in boys of Andhra Pradesh and lowest (less than 1 percent) in children of Karnataka. Prevalence of phrynoderma was higher (1.2 to 6.8 percent) in the state of Uttar Pradesh compared to other state of girls seemed to suffer more than boys.

Chandna et al (1994) observed in a study of school children aged 7-9 years that the mean intake of thiamine in boys 1.19 ± 0.14 (9.61) and girls 1.08 ± 0.15 (3.97) were significantly higher than recommended dietary allowances (1.0 mg). Intake of thiamine was significantly higher in boys than girls. Consumption of higher amount of groundnuts have contributed towards the higher intake of thiamine. Similarly, Sarupriya and Mathew (1988) also reported that adequate intake of thiamine by boys and girls, intake of riboflavin in boys 0.63 ± 0.18 (1.33) and girls 0.53 ± 0.13 (35.03) was significantly lower than recommended dietary allowances (1.2 mg).

Chhabra et al (1996) observed in a study of health and nutritional status of boys that sign of vitamin B deficiency in the form of cheilosis, angular stomatitis and glossitis were seen in 5 (2.6 percent) boys.

Vitamin C Deficiency

Malaviya et al (1969) observed that the prevalence of spongy and bleeding gums is 11.29 percent. The prevalence was found to be higher (12.39 percent) among boys while it was 2.36 percent among the girls. Data also shows that prevalence of spongy bleeding gums among the boys

increased as the age advanced, being absent in 4-5 years of age, and highest in the age group of 12-13 years. Among the girls the prevalence was observed only in the age group of 5-6 years (6.25 percent) and 7-8 years (7.14 percent).

Patodi et al (1977) in a study of school children in some primary schools of Indore city observed that out of 424 children signs of vitamin C deficiency was present in only 0.78 percent. Chandna et al (1994) in the study of school children (7-9 years) observed that mean intake of vitamin C in boys was 31.97 ± 22.08 (2.59) and in girls 27.54 ± 17.99 (4.94) was almost similar.

Vitamin D or Ca Deficiency

Malaviya et al (1969) observed that 14.34 percent (74 out of 516) manifested one or the other past sign of rickets further it may be seen that the skeletal defects were more in boys (19.02 percent) than in girls (4.73 percent). It may also be observed that among the boys, leaving the age groups of 13 to 15 years, the percentage of these defects ranged from 10.0 percent to 26.19 percent and occurrence of skeletal defects has no correlation with age. Among the girls the percentage was found to be the highest in age group of 8-9 years while it was found lowest among 7-8 years. An overall review of the occurrence in different age group among the girls reveals that the defect was concentrated between the age groups of 5-10 years. Among the various skeletal defects observed epiphyseal enlargements were 0-19 percent (i.e. in 516 students), beading of ribs 9.88 percent (i.e. 51 in 516), Knockknee or bowlegs 6.39 percent (i.e. 33 in 516) and frontal and parital bossing 6.20 percent (i.e. 32 in 516).

Patodi et al (1977) in a study of school children in primary school of Indore city observed that the amongst nutritional disorders vitamin D or Ca deficiency accounts for 1.43 percentage of total children studied. Sharma et al (1984) in a study of primary school children in urban area of Merrut city were examined 1089 children vitamin D deficiency was seen in 8.38 percent cases. Maximum number of children were between 5 to 9 years of age. Almost equally similar result (8.3 percent) were observed by Dhingra et al (1977).

Agarwal et al (1999) observed in a study of school girls that the vitamin D deficiency in the form of Rickets was present in 0.9 percent of cases and it was more common in girls of primary section 1.4 percent as compared to girls of secondary section where it was 0.4 percent. Kapil et al (1993) and Thomas (1992) in a study observed that nutritional deficiencies are more common in girls as compared to boys. Ignorance about the nutritive values of different foods and discrimination against the girls child may be important contributory factors for this observation.

DENTAL DISORDER

Malaviya et al (1969) in a study of school children observed that the prevalence of caries was found to be 50.77 percent (i.e. 262 out of 516 students examined). The prevalence among the boys was 53.60 percent while in girls it was 44.97 percent. 107 students out of 516 examined (20.73 percent) showed mottled enamel.

Patodi et al (1977) in a study of school children aged varied from 5 to 14 years observed that caries teeth was present in 3.31 percent children, while tartar deposit on teeth and mottling teeth were present in 6.64 percent and 0.26 percent children respectively overall prevalence of dental disorder

was quite high (10.2 percent) which can be explained by the fact that most of the children did not brush their teeth, or used only finger and water for cleaning their teeth.

Dwivedi et al (1978) observed in a study of school children that disease pattern was almost similar in primary school of rural and urban areas. In rural area dental caries contributed to 44.42 percent & in urban area 43.51 percent of all prevalent ailments. This may be due to the socio-economic and cultural background of people residing in Rewa town is Similar to that of people residing in rural area.

Dhar et al (1979) observed in a study of primary school children that the dental caries (26.51 percent) was the commonest defect observed being more common in boys than girls (30.62 percent boys and 20.06 percent girls). This high rate of dental caries in studied children could be explained by a generally poor orodental hygiene. It is possible that girls are being cared more than boys by their mothers and the boys are free to move outside to use more edibles. Various figures from other authors are: Pal (1966) observed 48 percent children with dental caries, Malaviya et al (1969) reported 50.77 percent children and Indra Bai and Malika (1976) reported 10.3 percent children with dental caries among school children. It is interesting to note that they did not find a single case of dental mottling in children indicating absence of fluorosis in Kashmir. The figures from other studies are Gill et al (1969) found mottling in 16.4 percent school children and koshi et al (1970) found nottling in 13.7 percent school children. This also corroborates with the fact that no case of fluorosis has been reported from Kashmir so far.

Sharma et al (1984) in a study of primary school children in Merrut city observed that the poor dental hygiene was seen in 40.40 percent cases. Mottling of teeth along with pitting was seen in 8.44 cases. Dental caries was found in 10.44 percent cases with maximum incidence at 7 years. Boys were more prone to dental caries (13.21 percent) as compared to girls (9.48 percent). Dental Caries was more common among muslims (13.71 percent) as compared to hindus (10.71 percent) and sikhs (5.5 percent).

Ganga et al (1991) in a study of dental caries reported out of 500 children, 161 children with caries (75.3 percent had cavity) 182 (36.4 percent) had one or more missing teeth. Nine (1.8 percent) had filled teeth. Males out numbered females in this study, contrary to earlier report Rule, (1982) McDonald et al (1981) reported that brushing of teeth within 15 minute of consumption of sweet reduced carious activity. Singh et al (1985) observed that the dental caries begins even before the 1st year of life.

Sharma et al (1991) in a nutritional, health and psychosocial profile of institutionalized children observed that dental mottling indicating fluorosis was seen in children of Uttar Pradesh (18.0 percent), Karnataka (8.0 percent), West Bengal (4.0 percent) and Andhra Pradesh (1 percent) prevalence of dental caries was seen in all four states and ranged from 1 to 22 percent.

Rao et al (1993) in a study of tribal school children observed that the dental caries was found in 128 (16.5 percent) children followed by calculus in 101 (13.0 percent) children. The less pathogonomic morbid stains were present in 191 (24.5 percent) children. Around 40 percent of children habituated to nus and dantum were suffering from dental caries. However, the prevalence of caries among children habituated to coal, ash, manjan and paste varied between 15-18 percent this difference was significantly greater

($P < 0.005$). Shrivastava et al (1990) observed in a study that in Uttar Pradesh only 12.5 percent of rural school children were habituated to tooth powder and ash. Laske et al (1986) observed that granular materials (Manjan, ash and coal) produce irreversible enamel damage and make the tooth susceptible for decay. Traeen and Jostein (1990), Obry-Musset et al (1991), Amid et al (1987) and Ganga et al (1991) reported that more than 80 percent in school children was due to dental caries. Thakre (1989) found that periodontal disease were prevalent among children who clean their teeth with ash, coal and manjan. Vaish, (1983) and Borle et al (1990) reported that tribal children are partially immune to dental caries but Talim (1983) reported equal proportions of periodontal disease among rural and urban children Mathur et al (1979) and Mistry (1983) reported that the relationship of nutritional status and dental caries is controversial.

Chhabra et al (1996) in a study of health status of boys aged 6 to 12 years observed that disease of the oral cavity were the next common morbidity presenting as caries teeth in 21 (10.9 percent) and periodontal disease in 10 (5.2 percent) boys.

Venugopal et al (1998) in an epidemiological study of dental caries observed that out of 2000 children examined 712 (35.6 percent) had caries, with a peak of 69.1 percent at the age of 9 years. Prevalence of caries was 53.5 percent in children with mixed dentition (6-12 year age group). It was 16.4 percent and 37.4 percent among children with primary dentition (1-5 year) and predominantly permanent dentition (13.14 year age group) respectively. The prevalence of caries in males 36.2 percent and female 34.9 percent was comparable ($P < 0.05$). There was no significant difference in prevalence of dental caries in children belonging to different religious group. But their study does not reveal much influence of parental

income on caries prevalence. Prevalence of caries was low in well nourished children and with vegetarian type of diet, higher prevalence was seen in children consuming sweets several times a day. Vaish (1982) showed higher prevalence among boys. While Verma et al (1986) and Dutta (1965) in their study showing higher prevalence in girls. But Chaudhary et al (1957) sharing similar experience as present study. They has not revealed much influence of parental income on caries prevalence. Khan et al (1990) reported higher prevalence of caries among higher socio-economic groups. Where as Verma et al (1986) and Dutta (1965) reported higher prevalence in low socio-economic group. Gill and Prasad (1968) observed in a study of primary school children that lower prevalence of caries among those using datun. Ann et al (1991) reported significant association between dental caries and frequency of consumption of sugary foods.

Agarwal et al (1999) in a study of school girls observed that the presence of dental caries in 61 percent of younger girls and 29.6 percent of adolescents reflect poor status of dental hygiene in the study population. Dental finding were seen in 26.1 percent girls with caries, mostly in secondary girls. Shetty (1992) reported that dental caries has been reported in nearly half of the school children of Mumbai, more commonly in affluent school children. Tragler (1981), Kapoor and Aneza (1992) reported that girls seem to be more susceptible for tooth decay than boys, for unexplained reason Gupta (1989) reported that dental caries is not so common in rural or slum school girls.

SKIN DISEASES

Patodi et al (1977) in a study of health status of primary school children observed that the out of 35.12 percent skin disorders among school children, majority of them suffered from multiple boils (9.37 percent), dermatitis (8.39 percent) and pediculosis (6.38 percent). High prevalence of these conditions also reflected poor standard of personal hygiene among surveyed children.

Dwivedi et al (1978) in a study of primary school children observed that disease pattern was almost similar in both rural and urban areas. Skin diseases in the form of scabies and boils accounts for 0.78 percent and 1.11 percent of all prevalent ailments in Rampur Baghelan block and Rewa town respectively.

Yaima et al (1981) observed in a study of morbidity pattern in urban school children that the skin disorder accounts for 6.4 percent of total children studied. Sharma et al (1984) in a study of primary school children in urban area of Merrut city observed that the skin diseases were seen in 18.63 percent cases. Pyoderma was seen in 11.47 percent, ring-worm in 5.05 percent and scabies in 2.11 percent cases.

Chhabra et al (1996) observed in a study of boys aged 6 to 12 years that the skin disease was the commonest morbidity (31.7 percent). Skin infections in the form of pyoderma, scabies and Prickly heat accounts for 14.6 percent, 10.4 percent and 6.7 percent respectively. Gangadharan et al (1977) reported the prevalence of skin infections as 23 percent in rural school children while Mukherjee and Sen Gupta (1960) observed a prevalence of 4.9 percent in urban school children and Rao et al (1984) reported a prevalence of 12 percent in rural school children . These

difference may be because of the living conditions, personal hygiene and climatic variations.

Agarwal et al (1999) in a study of health status of school girls from affluent population of Mumbai observed that the skin infections accounts for 7.0 percent of total children studied. Skin infections in the form of scabies and pediculosis was present in 2.5 percent and 21.5 percent respectively. Prevalence of scalp lice infestation in primary school girls has considerably declined to 10.5 percent, since in earlier study from the girls of same age group done in 1981, when it was seen in 46.6 percent Tragler (1981).

LYMPHADENOPATHY

Patodi et al (1977) in a study of primary school children aged 5 to 14 years observed that the lymphadenitis accounts for 0.78 percent of total children studied. Gangadharan (1977) in a study of school health service in Kerala observed cervical lymphadenopathy in 2.43 percent of the school children. Joseph (1977) observed lymphadenopathy in 2.1 percent of school children.

Dhar et al (1979) observed in a study of health status of primary school children in Kashmir that 8.16 percent children had submandibular lymphnode enlargement and 3.43 percent children had cervical gland enlargement. Enlargement of tonsils among 11.45 percent children was present in the study. Ray et al (1971) observed 7.95 percent tonsillitis and Dhingra et al (1977) found enlargement of tonsils among 5.6 percent children.

Yaima et al (1981) in a study of morbidity pattern of urban school children reported that lymphadenopathies was present in 9.2 percent of total

Dhar et al (1979) in a study of primary school children observed that ear wax was present in 7.17 percent and 5.17 percent of boys and girls respectively. Discharge in ear was present in 4.26 percent 3.65 percent in boys and girls respectively. Yaima et al (1981) reported in a study of morbidity pattern in urban school children that the ear disorder constitute 1.7 percent. Total prevalence of ear disease in case of male children was 2.2 percent while in case of female it was 0.8 percent.

Sharma et al (1984) in a study of primary school children in urban area observed that chronic suppurative otitis media was seen in 28 (2.57 percent) cases, otitis externa in 5 (0.46 percent) cases and hearing defect in 0.27 percent cases. It was seen more Commonly in muslims (4.76 percent) as compared to hindu (2.10 percent).

Chhabra et al (1996) in a study of health and nutritional status observed that ear disease in the form of chronic suppurative otitis media, and wax in ear constituted 7.3 percent and 1.5 percent respectively. Agarwal et al (1999) in a study of school girls observed that the deafness was present in 0.4 percent of cases and otitis media accounts for 2.0 percent of total studied girls.

DEFECTS OF THE EYE

Patodi et al (1977) in a study of primary school children observed that the main ophthalmic disorders were defective vision (8.59 percent), acute conjunctivitis (7.09 percent), blepharitis (3.90 percent), sty (2.80 percent) and trachoma accounts for 2.02 percent cases. Which can be treated and corrected easily with the help of teachers in schools. Other eye diseases which require specialist care were corneal opacity (0.78 percent), strabismus (0.32 percent) and cataract (0.19) percent.

Dwivedi et al (1978) in a study of primary school children observed that the diseases of eye in the form of trachoma conjunctivitis, refractory errors and corneal opacities contributes to 12.17 percent and 12.37 percent of all prevalent-aliment in rural and urban area respectively. Dhar et al (1979) in a study of primary school children observed that eye diseases in the form of conjunctivitis and blepharitis contributed to 0.38 percent of cases.

Shrivastava et al (1981) in a study of prevalence of Trachoma in school children of rural community observed that the overall prevalence of trachoma in children aged 5-14 years was 34.1 percent. There was gradual decline in the prevalence of trachoma with the advancement of the age being highest in the age group 5 to 6 years (50.8 percent) and lowest (31.2 percent) in the age group 11-12 years. This difference in the prevalence with age was significantly different ($P < 0.05$).

Yaima et al (1981) in a study of urban school children reported that total prevalence of eye disease was 6.1 percent. It was more common in male children than the female children. Sharma et al (1984) observed in a study of primary school children of urban area of Merrut that the eye disease were Seen in the form of conjunctivities (4.5 percent), stye and blepharitis in 6.27 percent cases, congenital squint 0.18 percent cases and keratomalacia in 0.09 percent cases.

Agarwal et al (1999) observed in a study of school girls from affluent population of Mumbai that the refractory errors (visual activity $> 6/9$) were seen in 564 (49.3 percent) girls, including 56.8 percent and 40.3 percent girls of primary and secondary sections respectively. Only 9.4 percent total

girls were actually using spectacles, including 4.4 percent of primary and 15.6 percent of secondary section girls. Refractory errors were noticed in nearly half of girls, more frequently than that reported by Tragler (1981) and Shetty (1992).

RESPIRATORY SYSTEM

Dwivedi et al (1978) in a study of health status of primary school children in rural and urban area reported that prevalence of respiratory tract infection in children from Rampur Baghelan block was 6.58 percent while children from Rewa town it was 6.89 percent. Study showed that disease pattern was almost similar in both areas. This may be because the socio-economic and cultural background of people residing in Rewa town is similar to that of people residing in rural area.

Yaima et al (1981) observed in a study of morbidity pattern of school children that respiratory disorder accounts for 2.8 percent of total morbidities. In case of male children prevalence of respiratory disease was 3.5 percent and in case of female it was 1.5 percent.

Chhabra et al (1996) in a study of health status of boys observed that total prevalence of respiratory tract infection was 8.7 percent. Respiratory diseases in the form of upper respiratory infection accounts for 7.2 percent, while pneumonia was present in 1.5 percent of children. A similar prevalence has been observed by Gangadharan (1977) Rao et al (1984) and Sharma et al (1991) in studies conducted in school.

Agarwal et al (1999) observed in a study of health status of school girls from affluent population of Mumbai that the respiratory disease in the form of bronchial asthma in 6.6 percent of subjects is not unexpected, as

Mumbai has hot and humid climate with heavy pollution. 0.8 percent of girls had tubercular infection of lungs.

CARDIOVASCULAR SYSTEM:

Merchant and Abraham (1975) in a study of children in Bombay city observed that functional murmurs was present in 7.4 percent children, congenital heart disease in 1.2 percent and constrictive pericarditis in 0.12 percent children.

Agarwal et al (1999) in a study of school girls observed that cardiac disease accounts for 0.5 percent of cases. Among six cardiac lesion, two were rheumatic in origin. Hypertension was seen in 2.2 percent girls and nearly half of them were obese.

GASTROINTESTINAL DISORDER

Patodi et al (1977) in a study of school children in primary schools of Indore city observed that out of 1537 school children examined disease of gastrointestinal system was present in 1.56 percent of individuals.

Chhabra et al (1996) in a study of boys aged 6 to 12 years observed that total prevalence of gastrointestinal disorder was 8.8 percent. Diarrhoea was the most common gastrointestinal morbidity observed, being present in 4.7 percent of boys, followed by worm infestation (3.6 percent) and acid peptic disease (0.5 percent) in total boys studied.

WORM INFESTATION

Dhar et al (1979) in a study of primary school children in Hazratbal area (Kashmir) observed that prevalence of ascariasis was almost universal, 94.20 percent. All the age groups had infestation children with mild infestation was 33.50 percent, with moderate 48.64 percent and 12.10 percent children had severe infestation. However Wani (1970) found 80.7 percent ascariasis infestation in kashmir and Gill et al (1969) in their study have shown 0.8 percent prevalence.

Yaima et al (1981) in a study of urban school children reported that worm infestation was present in 24.8 percent of cases. It was more in male children (27.4 percent) than in female children (20.3 percent) and this might be attributed to out of home eating habit.

Agarwal et al (1999) in a study of school girls from affluent population of Mumbai observed that overall prevalence of worm infestation was 17.0 percent, it was 24.1 percent in girls of primary section and 8.4 percent in those of secondary section. Worm infestation were common in younger girls, as reported by Tragler (1981) and Gupta (1989).

LIVER & SPLEEN ENLARGEMENT

Malaviya et al (1969) in a study of primary school children reported that liver was found palpable and enlarged in 6 students out of 516 (i.e. 1.16 percent). This enlargement of liver was not found associated with tenderness. No case of enlargement of spleen could be detected.

Agarwal et al (1999) observed in a study of school girls that the splenomegaly was present in 1.6 percent of total children studied.

DISEASES OF GENITO-URINARY SYSTEM

Gangadharan (1977) observed that 1.09 percent children had genitourinary disease (phimosis 0.04 percent, chronic UTI 0.57 percent). Dhingra et al (1977) observed 0.6 percent disease of the urogenital system in corporation school as compared to nil in public school of Delhi. Sundaram (1978) observed undescended testis in 0.1 percent corporation school children as compared to 0.1 percent private school children.

Patodi et al (1977) observed in a study of health status of school children in primary schools of Indore city that disease of genitourinary system was present in 0.20 percent of total children studied. Agarwal et al (1999) observed in a study of school girls that urinary tract infection was present in 0.9 percent of cases.

DISEASES OF SKELETAL SYSTEM

Merchant and Norah (1975) observed orthopaedic disorders like pigeon chest, T.B. Spine, dislocation etc present in 3 children out of 835 children. Gangadharan (1977) observed 0.52 percent having musculo-skeletal disease (residual polio in 0.13 percent, kyphoscoliosis 0.13 percent).

Sundaram (1978) observed residual polio in 0.2 percent corporation school children as compared to 0.1 percent in private school. Other orthopaedic defects were 0.8 percent and 0.4 percent respectively. Yaima et al (1981) observed musculo skeletal disorder in 0.3 percent school children.

DISEASES OF CENTRAL NERVOUS SYSTEM

Patodi et al (1977) in a study of health status of primary school of Indore city reported that diseases related to nervous system was present in 3 children and proportional morbidity rate was 0.15 percent. Gangadharan (1977) observed CNS disorder in 0.67 percent children. Joseph (1977) observed epilepsy in 0.10 percent cases.

Agarwal et al (1999) in a study of school girls observed that among the central nervous system disorder epilepsy accounts for 0.4 percent of cases.

THYROID ENLARGEMENT

Malaviya et al (1969) in a study of primary school children observed that 14 out of 516 students examined (2.7 percent) showed enlargement of thyroid gland. The majority of them fell within the age group of 4-7 years.

CONGENITAL DEFECTS

Dwivedi et al (1978) in a study of health status of primary school children observed that children from Rampur Baghelan block, 0.08 percent had congenital anomalies while children from Rewa town reported prevalence was 0.41 percent.

Yaima et al (1981) in a study of morbidity pattern in urban area observed that total prevalence of congenital defect found in male children was 0.4 percent but no case had been reported in female children.

BEHAVIOUR PROBLEMS

Srivastava et al (1978) observed that number of children having behaviour problems in public school was 31.57 percent and in Govt school was 37.67 percent. Nocturnal enuresis was present in 26.24 percent children and 34.51 percent children respectively.

Agarwal et al (1999) observed in a study of health status of school girls that the behavioural problems are common due to excessive stress, competitiveness, high parental expectations and consequent anxiety. In their study most of the problems seen i.e. nail biting, vague aches and pains, thumb sucking etc., indirectly indicate highly stressful and anxiety related behaviour. These problems were less frequently noted in older girls probably in the absence of experienced psychiatrist, it was difficult to extract the hidden behaviour of older girls. Narang et al (1991) in a study of psychiatric symptomatology in children in high & low socio-economic group, observed that behavioural problems were mostly due to anxiety. It was observed that nail biting was present in 6.5 percent, vague aches and pains in 3.4 percent, pica in 3.2 percent, thumb sucking 1.1 percent, nocturnal enuresis 0.8 percent, miscellaneous 0.6 percent of cases.

SPEECH

Joseph (1977) in a study of health problems in rural school children observed that speech disorders were present in 0.5 percent of school children.

Shrivastava et al (1978) observed that 2 percent children from public school (lalling 1.43 percent and stammering 0.58 percent) had speech disorder as compared to 7.33 percent from Govt school (4.33 percent lalling

and 2.0 percent stammering). Gangadharan (1977) observed that stammering was present in 0.04 percent of rural school children.

IQ

An IQ is an expression of an individual's ability level at a given point in time, in relation to his age norm. To the layman, the IQ is not identified with a particular type of score on a particular test, but is often a shorthand designation for intelligence. IQ is not fixed and unchanging and it is amenable to modification by environmental interventions. According to Alexander Bain intelligence is the aggregate or global capacity of the individual to act purposefully to think rationally and to deal effectively with his environment.

New born child grows in all spheres of development, his muscles grow in size and strength, the brain grows in size, his nervous system assumes greater and greater complexity, he also grows mentally. The innumerable abilities which form part of what is called intelligence grow steadily. In fact it is known that there is a great parallel between physical development and mental development. This subtle relationship between the two led Alfred Binet to postulate an index of brightness expressed in terms of the ratio of mental age (M.A.) to the chronological age (C.A.).

IQ is not fixed and unchanging and it is amenable to modification by environmental interventions. Other evidence comes from a variety of investigations dealing with the effects of education, special training programs and major environmental changes (Anastasi, 1958). An individual's intelligence at any point in time is the end product of a vast and complex sequence of interactions between hereditary and environmental factors.

In different cultures and at different historical periods with in the same culture, the qualification for successful achievement will differ. The changing composition of intelligence can also be recognized within the life of individual from infancy to adulthood. An individual's relative ability will tend to increase with age in those functions whose value is emphasised by his culture or subculture and his relative ability will tend to decrease with age in those functions whose value is de-emphasised (Levinson, 1959, 1961).

Nutrition of the children is an important physical factor for the growth and development of this most important cognitive ability. Maier (1932) showed that malnutrition in rats resulting in 3 percent changes of cerebral tissue affects the complex learning processes. Similarly the animal studies of Champakam (1968) revealed that protein calorie malnutrition not only retards the physical growth but also impairs several aspects of mental faculties.

Cravioto (1971) again assessed the level of intelligence of school children who in early infancy had been admitted in the hospital for malnutrition. The intelligence level was measured by wechsler intelligence scale in which both verbal and performance tests were applied.

PHYCHOSOCIAL ASSESSMENT

Gupta et al (1975) in a study of school children observed that children from nourished group performed better as compared to malnourished group on the Stanford Binet test of intelligence. All the children in nourished group had their IQ's more than 90 whereas only 27.1 percent children from the malnourished group was as much as 29 points higher as compared to malnourished group.

Dhingra et al (1977) observed in a study if school children from public schools and corporation school observed that children belonging to public schools were comparable to the corporation school children for their age but not for their socio-economic states. Mean IQ of public school children were significantly higher as compared to the children of same nutritional status. Children of class I obtained an IQ between 121-130 where as social class IV children obtained an IQ of 100 and below with 18.5 percent as mentally subnormal, 86.6 percent of social class II children had IQ above 101. Majority of social class III children (83.7 percent) were found having IQ between 91-100.

Dwivedi et al (1978) in a study of health status of primary school children in rural and urban areas observed that prevalence of mentally retarded children in Rampur Baghelan block was 0.28 percent while in Rewa town it was 0.44 percent of all prevalent ailments.

Kadam (1984) in a study observed that if malnutrition is severe and occurs early may result in reduced mental development due to impairment of brain development during the period of rapid growth. Puri (1984) observed that adequate quantity of good quality protein does enhance I.Q. Inference drawn is that supplementary feeding in pre-school children showed significant improvement in I.Q. of children.

Darrel and Wilson (1986) in a study of children observed that therapies designed to increase height are unlikely to alter measures of intellectual development. They used weschler intelligence scale.

Chaturvedi (1987) observed that upper intellectual grade $IQ \geq 110$ were greater in ICDS sample of children who were better nourished. Shrivastava (1988) observed in a study of school children using Ravan

coloured progressive matrices, that the median IQ of nourished children was found to be 112.5 and for malnourished children was 94.5. The median IQ of malnourished children was found to be decrease with the increase in the degree of malnutrition being 96.0 for grade I, 87.0 for grade II and 77.5 for grade III malnourished children.

Sharma et al (1991) in a study of psychosocial profile of children observed that the mean scores on Binet-Kamat and draw a mean tests in different nutritional grade showed significant differences. The mean IQ level showed a decreasing trend with lower nutritional grades. However, in case of social maturity scale the scores were above average in all the nutritional groups. Children with normal nutritional status IQ was ≥ 95 , with grade I undernutrition IQ ranged from 90-95 and grade II+III undernutrition IQ was below 90.

SCHOOL ENVIRONMENT

Recommendations for healthful school living were made regarding environmental factors and the school day lighting, heating and ventilation, water supply and toilet and shower room facilities were some of the items considered necessary to healthful school environment. Hygiene were replaced by the term "healthful school living".

The school building, site and equipment are part of the environment in which child grows and develops. A healthful school environment therefore is necessary for the best emotional, social and personal health of the child.

Sundaram (1979) in a study of primary schools of Madras city comprising both of corporation and private schools observed that private school (84 percent) were better located than corporation schools (55 percent). Corporation schools are located in close proximity to the residences of the economically weaker sections of the society while private school were located in proper environmental hygiene. Maintenance of buildings in corporation schools was not satisfactory. Inadequate space for class rooms was a common feature in both group (72 percent and 66 percent). Only 50 percent of both group were adequately lighted & ventilated.

**MATERIAL
AND
METHODS**

MATERIAL & METHODS

The present study is an attempt to ascertain the health status of primary school children of Jhansi city. Four school were selected following cluster sampling from the Jhansi city.

Plan of study

Selected schools were two Government schools namely (Basic D.C. Talpura & Arya Kanya Inter College, primary section) and two convent schools (Christ the King and Kendriya Vidhyala No-II)

1. ***Basic D.C. school, Talpura*** – is located is Talpura area of Jhansi city which is densely populated and inhabited by deprived classes of the community. The school is located in crowded area, near public health hazards. It is just off the Jhansi-Kanpur Highway which has heavy traffic. The total number of students from class I to V were 524.
2. ***Arya Kanya Inter College*** – It is located in a busy resident cum market area of Sipri Bazar, Jhansi. The area is thickly populated with dust and other nuisance. The total strength of the school from class I to V is 238.
3. ***Christ the King Primary School*** – This is behind the District Jail. School is located in sanitary surrounding away from traffic, noise, market, factory etc. Total strength of the school from class I to V is 1500.
4. ***Kendriya Vidhyalaya No.II*** – This is located in open ground in Cantonment Board of Jhansi. It is located in open field with sanitary surrounding. The total children studying from class I to V was 735.

Selected school children of age group 5-11 years, during the study period, attending the various school of Jhansi, comprised the study material. Only 840 children could be examined after repeated survey, 453 from municipal schools and 387 from convent schools. The study was conducted in the school itself during working hours and a detailed pretested structured schedule concerning socio-demographic profile, immunization status, anthropometric measurement, personal hygiene and morbidity patterns of primary school children had been filled in separate child proforma (Appendix-I).

Period of study : The survey work was started in July '98 and was completed within 12 months.

Pilot study : A pilot study was carried out to test the individual schedule and schedules were modified according to experience thus gained.

Determination of Sample Size :

In a field, survey to estimate the prevalence rate of disease the sample size is calculated by the formula -

$$N = 4PQ/L^2$$

where N = required sample size

P = the approximate prevalence rate of disease

Q = 1-P and

L = the permissible error in the estimate of P

average reported prevalence rate of ascariasis is about 40% then the sample size required to estimate the prevalence rate of ascariasis with 10% error is calculated as follows.

$$P = 40\%$$

$$Q = 100 - 40 = 60\%$$

$$L = 10\% \text{ of } 40\% = 4$$

$$M = 4 \times 40 \times 60 / (4)^2 = 4 \times 40 \times 60 / 16 = 600$$

Thus 600 children were required to be examined to estimate the ascariasis positively rate with an error of 10%.

It was decided that 4 different schools of Jhansi city – two municipal schools and two convent school would be adequate to cover this no. of children.

Methodology :

The age of the children were estimated on the basis of their date of birth as recorded in the school admission register. Information was collected regarding socio economic status from the school records and accordingly the social class of sample group was determined by modified Prasad classification (1991) of Socio-economic scale.

The information regarding caste, religion, size of family and education and occupation of their parents were obtained by interviewing the child.

Regarding personal hygiene each child was examined for the cleanliness of their hair, mouth, teeth, ears, clothing, footwear and their bathing and ablution habits. An enquiry was made to find out any disease condition, their nature, duration and treatment for the same.

Detailed medical history was taken, followed by general, physical and systemic examination. An attempt was made to detect the signs of any specific vitamin deficiency and general malnutrition.

Dental examination was carried out and presence of dental caries, malocclusion, mottled enamel and disease of gums like spongy and bleeding gums were taken into account. Examination was carried out for signs of adenoids, tonsillitis, otitis media and sinusitis. Thyroid gland was examined to find out any abnormality. Eyes were examined for any signs of trachoma, conjunctivitis, styne, ptosis, squint and congenital anomalies.

Systemic examination was done including respiratory system, cardiovascular system, central nervous system and gastrointestinal system. Vision was tested by means of standard chart.

For hearing ability, the whisper test was used to note any defect in hearing. For speech the child was asked to say familiar words and simple sentences. The child was asked to questions like whether he sucks his thumb and does he bites his nails or wet his bed.

Nutritional status of children was assessed on the basis of weight for age and weight for height measures and were compared with ICMR standards. Anthropometric measurements like height, weight and mid arm

circumference were recorded as per standard methods (Jelliffe, 1966). Height was measured by using vertical measuring scale to the nearest 0.5cm. Mid arm circumference was measured while left arm hanging freely at its mid point (between acromian process of scapula and olecranon process of ulna). The arm circumference is measured to the nearest 0.1 cm with a fibre glass tape, which was placed gently, but firmly, round the limb to avoid compression of soft tissue.

Level of intelligence of children was tested by Bharat Raj Method. The purpose of this test was to measure mental development of child and the test provides for a brief and fairly dependable assessment without requiring the use of performance tests.

Testing was done by semistructured interview with a teacher well acquainted with the child. The test was administered individually in a room free from any extraneous disturbance. The items included in the schedule stand for discrete and discernible behavioural characteristics representative of respective age levels. At each age level, items are drawn from behavioural fields like motor development speech – language development and personal – social development. Having obtained the mental age (MA) the IQ calculator was used. The derived mental age was synchronised with the actual age of the child and IQ was directly read off from the slit. Distribution of scores and its interpretation based on obtained IQs is given.

The categories are mentally defective (65-74), border line (75-80), dull normal (81-90), average (91-110), bright normal (111-114), superior (120-125) very superior (125-130).

The data of IQ was then analysed in relation to nutrition and various socio-economic factors influencing the intelligence.

Blood sample could not be collected because school authorities had refused for this. Serially numbered small bottles were distributed to children for collection of stool samples. Examination of samples were done to detect the presence of ova and cysts of parasites.

All the school were studied for school environment including location, site, class room, furniture, water supply, eating and lavatory facility etc. Inquiry was made regarding school health programme including health record, mid day meal, periodic medical examination, health education, health services, first aid and emergency care.

Data so obtained from the study was subjected to critical statistical analysis, which consisted of examining possible associations of health status of children studied with various socio-economic and school environments and other factors. Difference between municipal schools and convent schools were examined statistically.

OBSERVATIONS

OBSERVATION

In the present study a total of 840 primary schools children aged 5-11 years were examined. Of these 453 children were from municipal schools and 387 children were from convent schools of Jhansi City. IQ test was carried out in 210 children. Following are the observations made in the present study.

Table – I
Sex wise distribution of surveyed children

Name of School	Total No. of Children	MALE		FEMALE	
		No.	%	No.	%
<u>Municipal School:</u>	253	155	61.26	98	38.73
Basic D.C School Talpura					
Arya Kanya Inter College, Sipri Bazar	200	NA	NA	200	100.00
<u>Convent school:</u>	198	101	51.01	97	48.98
Kendriya Vidhalaya (No.II),Jhansi Cantt					
Christ the King College – Primary Section	189	189	100.00	NA	NA
Total	840	445	52.98	395	47.02

NA – Not applicable

Total of 840 children were studied in four different schools of urban Jhansi. The number of children studied in each school were almost equal. The percentage of male children was 52.98%, remaining 47.02% being females.

Table – II*Showing distribution of children according to religion*

Religion	Municipal school (n=453)				Convent School (n=387)				Total (n=840)	
	Boys	Girls	No.	%	Boys	Girls	No.	%	No.	%
Hindu	168	109	277	61.15	235	84	319	82.42	596	70.95
Muslim	117	59	176	38.85	08	-	08	2.06	184	21.91
Others	-	-	-	-	51	09	60	15.50	60	7.14
Total	285	168	453	100	294	93	387	100	840	100.0

The majority of children in both types of schools were hindus (70.95%) followed by muslims (21.92%) and children belonging to others religion were only 7.14%.

Table – III*Showing distribution of children according to caste.*

Caste	Municipal school (n=453)				Convent School (n=387)				Total (n=840)	
	Boys	Girls	No.	%	Boys	Girls	No.	%	No.	%
Scheduled	59	17	76	16.77	07	1	08	2.06	84	10.0
Backward	126	84	210	46.35	34	34	68	17.57	278	33.0
Others	100	67	167	36.88	252	59	311	80.36	478	56.90

Out of the total children studied, 56.90% were from other caste, 33.0% backward caste and 10.0% children scheduled caste. 80.36% of the children in convent schools belonged to other caste as compared to 36.88% in municipal schools. Similarly, 2.06% children of convent schools and 16.77% children of municipal schools belonged to scheduled caste.

Table – IV*Showing level of personal hygiene in children.*

Personal Hygiene	Municipal school (n=453)				Convent School (n=387)				Total	
	Boys	Girls	No	%	Boys	Girls	No	%	No.	%
Good (score: 14-16)	-	-	-	-	252	51	303	78.29	303	36.07
Fair (Score : 8-13)	101	50	151	33.34	42	42	84	21.71	235	27.97
Poor(Score: Less than 8)	184	118	302	66.66	-	-	-	-	302	35.96

* Appendix - 1

Level of personal hygiene was assessed on the basis of scoring method. 36.07% children had good personal hygiene, 27.97% had fair and 35.95% of children had poor personal hygiene. 33.33% children in municipal school had fair personal hygiene and 66.66% had poor personal hygiene. There was no child who had good personal hygiene.

As compared to municipal school, 78.29% of children in convent school had good personal hygiene and 21.70% had fair personal hygiene and none had poor level of personal hygiene.

Table – V*Showing distribution of children by food habits.*

Food Habits	Municipal school (n=453)				Convent School (n=387)				Total (n=840)	
	Boys	Girls	No.	%	Boys	Girls	No.	%	No.	%
Vegetarian	159	101	260	57.39	193	67	260	67.18	520	61.91
Non-Vegetarian	126	67	193	42.61	101	26	127	32.82	320	38.09

Of the total children studied, 61.91% were vegetarian and remaining 38.09% were non-vegetarians. In both the schools children having vegetarian diet were more than non-vegetarian diet and this difference was found to be statistically highly significant ($\chi^2=24.47$, d.f=1, $P<0.001$).

Table – VI*Showing distribution of children according to immunisation status.*

Immunisation Status	Municipal school (n=453)				Convent School (n=387)				Total (n=840)	
	Boys	Girls	No.	%	Boys	Girls	No.	%	No.	%
BCG	170	137	307	67.77	172	153	325	83.97	632	75.23
Polio	181	130	311	68.65	163	150	313	80.88	624	74.28
D.P.T	181	130	311	68.65	169	144	313	80.88	624	74.28
Measles	132	75	207	45.69	138	136	274	70.80	481	57.26
M.M.R (Measles, Mumps, Rubella)	-	-	-	-	2	-	2	0.62	2	0.24
Hepatitis B	-	-	-	-	4	2	6	1.5	6	0.71

Of the total children studied, 75.23% had BCG scars, 74.28% had immunised against Polio, 74.28% against D.P.T, 57.26% against Measles, 0.24 percent against Measles, Mumps, Rubella and 0.71% against Hepatitis B. Children belonging to municipal school 67.77% had B.C.G scars and 68.65% were immunised against polio and D.P.T. and 45.69% against measles. The corresponding percentages were much higher for convent school children, 83.97 percent, 80.88 percent and 70.80 percent. 0.62 percent children against Measles, Mumps, Rubella and 1.5 percent against Hepatitis B were immunised in convent school as compared to none in municipal school.

Table – VII*Showing literacy status of parents of surveyed children.*

Literacy Status	Municipal School (n =453)				Convent School (n =387)				Total (no. 840)			
	father		mother		father		mother		father		mother	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Illiterate	25	5.51	276	60.92	3	0.78	7	1.80	28	3.33	283	33.69
Middle & Primary	67	14.79	143	31.56	5	1.29	8	2.07	72	8.57	151	17.98
High School	193	42.60	25	5.51	8	2.07	08	2.06	201	23.92	33	3.92
Intermediate	160	35.50	6	1.32	19	56.58	08	2.06	179	21.30	14	1.66
Professional	4	0.88	2	0.44	59	15.24	9	2.32	63	7.5	11	1.31
Graduates	68	15.01	8	1.77	32	82.68	160	41.34	100	11.90	168	20.0

Of the total children studied, 3.33% of fathers and 33.69% of mothers were illiterate 82.68% of children of convent school had fathers who were graduate as compared to 15.0% in municipal school. 60.92% of Mothers and 5.51% of fathers in municipal schools were illiterate as compared to 1.8% and 0.78% respectively in convent schools.

Table – VIII*Showing occupational status of parents of surveyed children.*

Occupation	Municipal School				Convent School				Total			
	(n =453)				(n =387)				(No. 840)			
	father		mother		father		mother		father		mother	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Service	49	10.81	11	2.43	302	78.03	101	26.09	302	35.95	101	12.03
Business	17	3.75	-	-	85	21.96	08	2.06	102	12.14	8	0.95
Agriculture/ House wife	13 6	30.02	403	88.96	-	-	278	71.85	185	22.02	681	81.07
Labourer	76	16.77	50	11.03	-	-	-	-	76	9.05	50	5.95
Skilled	16	36.86	-	-	-	-	-	-	167	19.88	-	-
Others	7 08	1.76	-	-	-	-	-	-	08	0.95	-	-

Father of 48.09% children were in service/business, 22.02% were in agriculture and 28.93% were labourer/ skilled worker. In convent school 78.03% had father in service and 21.96% had father in business. In municipal school 30.02% had father in agriculture, 16.77% were labourer and 36.86% were skilled worker and only 3.75% had father who were in business.

Of the total children studied, mothers of 81.0% children were either housewife or in agriculture. In convent school 71.83% of children had mothers who were housewife as compared to 88.96% in municipal school. 11.03% children mother in municipal school were labourer as compared to none in convent school.

Table – IX

Showing distribution of children according to social class (modified Prasad classification, updated 1998-99)

Social Class	Municipal school (n=453)				Convent School (n=387)				Total (n=840)	
	Boys	Girls	No	%	Boys	Girls	No	%	No.	%
I	-	-	-	-	271	59	330	85.27	330	39.29
II	-	-	-	-	21	28	49	12.66	49	5.84
III	90	85	175	38.63	2	6	8	2.06	183	21.78
IV	165	52	217	47.90	-	-	-	-	217	25.83
V	30	31	61	13.46	-	-	-	-	61	7.26

Out of total children studied, 39.29% children were from social class I, 5.83% from social class II, 21.78% from social class III, 25.83% from social class IV and 7.26% children from social class V. 85.27% children from convent schools belonged to social class I and only 14.72% to social class II & III. In convent school there was no child belonging to social class IV and V while in municipal schools 38.63% children belonged to social class III, 47.90% from Social class IV and 13.46% from social class V there was no child belonging to social class I and II.

TABLE - X

*Mean weight of boys of convent and municipal School
in comparison with ICMR values*

Age in Years	Municipal School (n=453)		Convent School (n=387)	
	Mean Weight (in kg)	ICMR Standard	Mean Weight (in kg)	ICMR Standard
5 - < 6	15.3 (\pm 1.9)	14.8	16.5 (\pm 2.3)	14.8
6 - < 7	18.2 (\pm 3.0)	16.3	19.5 (\pm 1.8)	16.3
7 - < 8	19.4 (\pm 2.4)	18.0	20.0 (\pm 2.3)	18.0
8 - < 9	20.8 (\pm 3.4)	19.7	22.4 (\pm 2.6)	19.7
9 - < 10	22.6 (\pm 3.2)	21.15	23.4 (\pm 3.4)	21.5
10 - < 11	24.5 (\pm 2.4)	23.5	26.5 (\pm 2.5)	23.5

(Figure in brackets are S.D.)

Mean weight of all male children in both type of schools had higher values as compared to the ICMR standards. Mean weight of convent school boys showing higher values than those of municipal school boys for all ages.

MEAN WEIGHT OF MALE CHILDREN

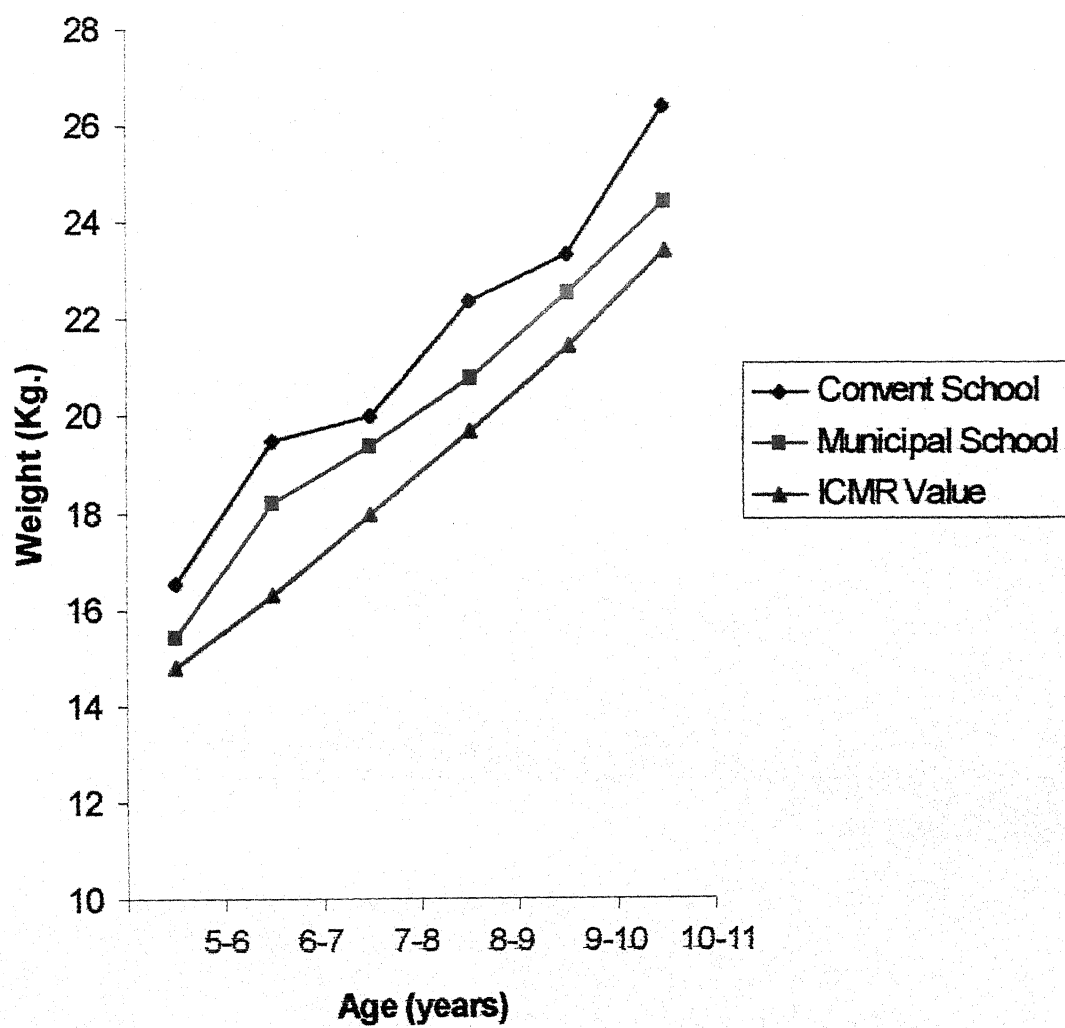


TABLE - XI

*Mean weight of girls of convent and municipal school
in comparison with ICMR values*

Age in Years	<u>Municipal School (n=453)</u>		<u>Convent School (n=387)</u>	
	Mean Weight (in kg)	ICMR Standard	Mean Weight (in kg)	ICMR Standard
5 - < 6	15.0 (\pm 1.9)	14.5	15.6 (\pm 1.5)	14.5
6 - < 7	16.5 (\pm 2.5)	16.0	19.0 (\pm 3.1)	16.0
7 - < 8	18.7 (\pm 2.5)	17.4	21.8 (\pm 2.5)	17.4
8 - < 9	22.8 (\pm 2.9)	19.4	23.8 (\pm 2.9)	19.4
9 - < 10	23.4 (\pm 2.4)	21.3	25.8 (\pm 2.1)	21.3
10 - < 11	25.4 (\pm 2.8)	23.6	26.8 (\pm 3.1)	23.6

(Figure in brackets are S.D.)

The mean weight of girls for all ages was higher as compared to all India averages (ICMR standards). Mean weight of girls from convent school was higher than those of municipal schools for all ages.

MEAN WEIGHT OF FEMALE CHILDREN

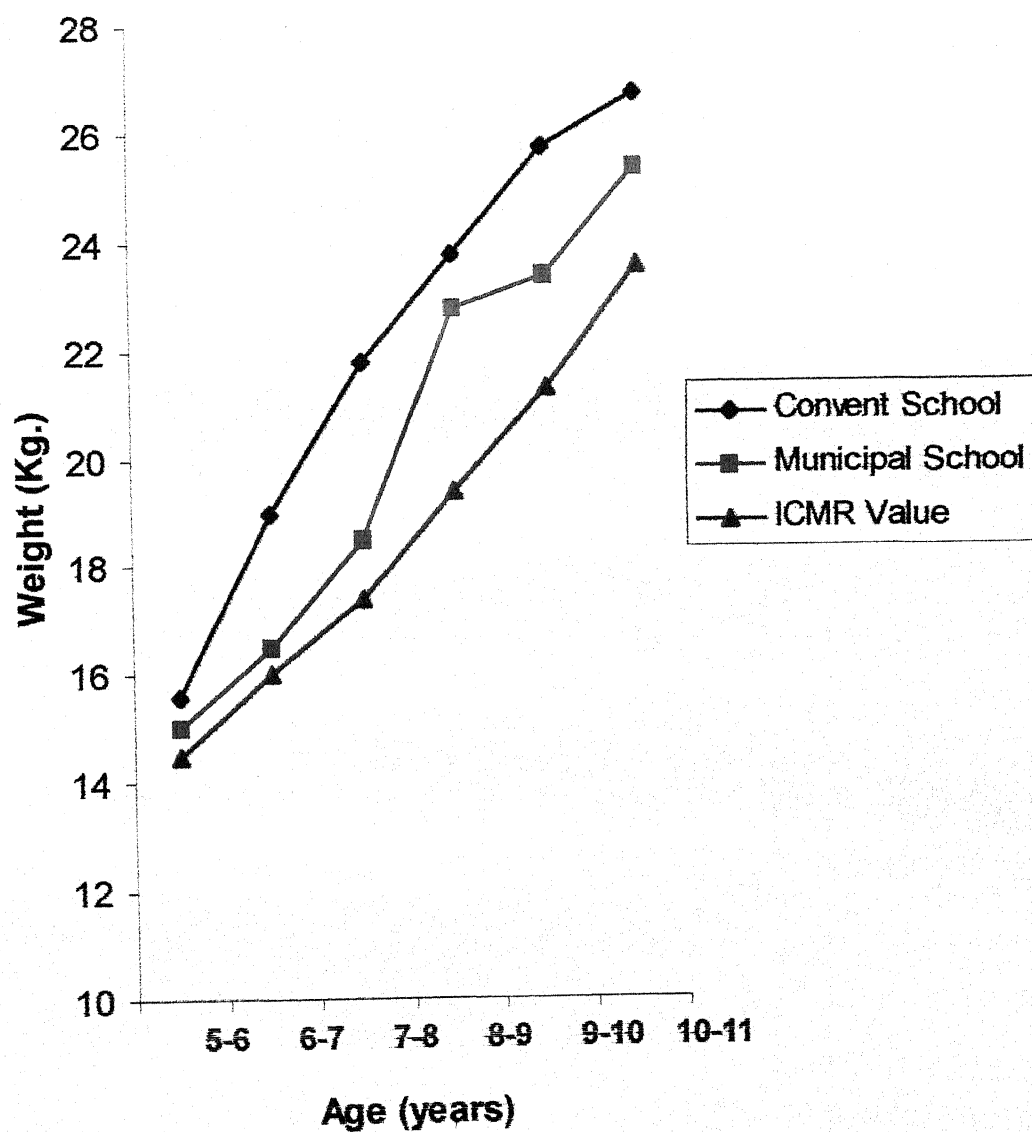


TABLE - XII

*Mean height of boys of convent and municipal school
in comparison with ICMR values*

Age in Years	Municipal School (n=453)		Convent School (n=387)	
	Mean height (in cm)	ICMR Standard	Mean height (in cm)	ICMR Standard
5 - < 6	104.5 (\pm 4.2)	102.1	112.0 (\pm 5.5)	102.1
6 - < 7	112.3 (\pm 5.9)	108.5	114.5 (\pm 5.8)	108.5
7 - < 8	118.5 (\pm 6.3)	113.9	119.5 (\pm 6.6)	113.9
8 - < 9	123.5 (\pm 5.3)	119.3	125.6 (\pm 5.2)	119.3
9 - < 10	125.0 (\pm 5.8)	123.7	128.9 (\pm 5.3)	123.7
10 - < 11	129.8 (\pm 5.9)	124.4	34.8 (\pm 5.2)	124.4

(Figure in brackets are S.D.)

The mean height of boys for all ages was higher than ICMR standards. The average height of male children from convent schools was higher than their counterparts in municipal schools.

MEAN HEIGHT OF MALE CHILDREN

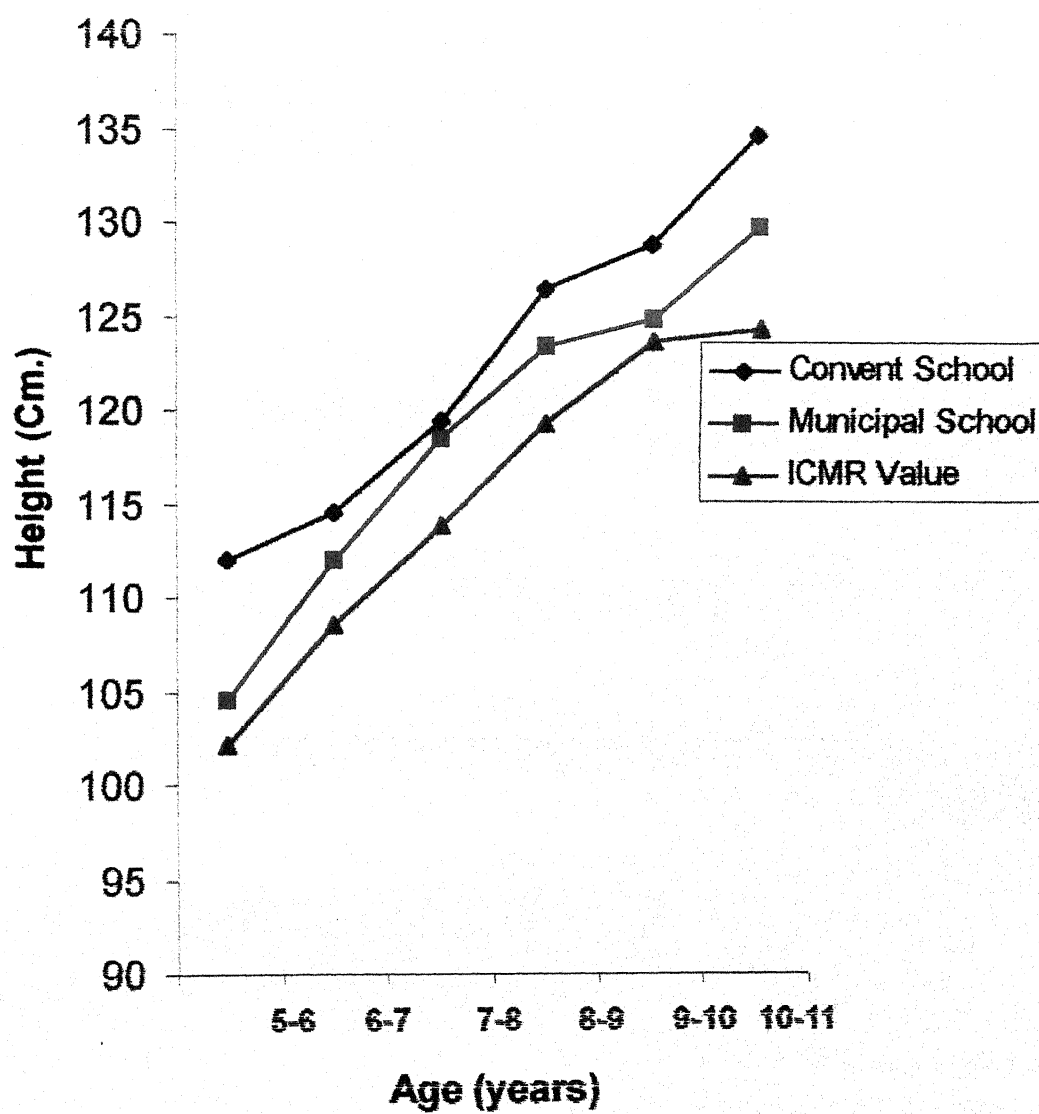


TABLE - XIII

*Mean height of girls of convent and municipal school
in comparison with ICMR values*

Age in Years	Municipal School (n=453)		Convent School (n=387)	
	Mean height (in cm)	ICMR Standard	Mean height (in cm)	ICMR Standard
5 - < 6	103.8 (\pm 3.2)	101.4	110.0 (\pm 5.8)	101.4
6 - < 7	108.9 (\pm 3.8)	107.4	116.0 (\pm 8.3)	107.4
7 - < 8	115.4 (\pm 7.5)	112.8	119.0 (\pm 5.2)	112.8
8 - < 9	120.0 (\pm 6.0)	118.2	126.5 (\pm 5.2)	118.2
9 - < 10	129.5 (\pm 7.4)	122.9	130.5 (\pm 7.6)	122.9
10 - < 11	132.8 (\pm 4.2)	128.4	134.6 (\pm 8.9)	128.4

(Figure in brackets are S.D.)

The above table indicates that mean height of girls in both type of schools had higher values when compared to ICMR standard. Mean height of convent schools girls was higher as compared to their counterparts in municipal school.

MEAN HEIGHT OF FEMALE CHILDREN

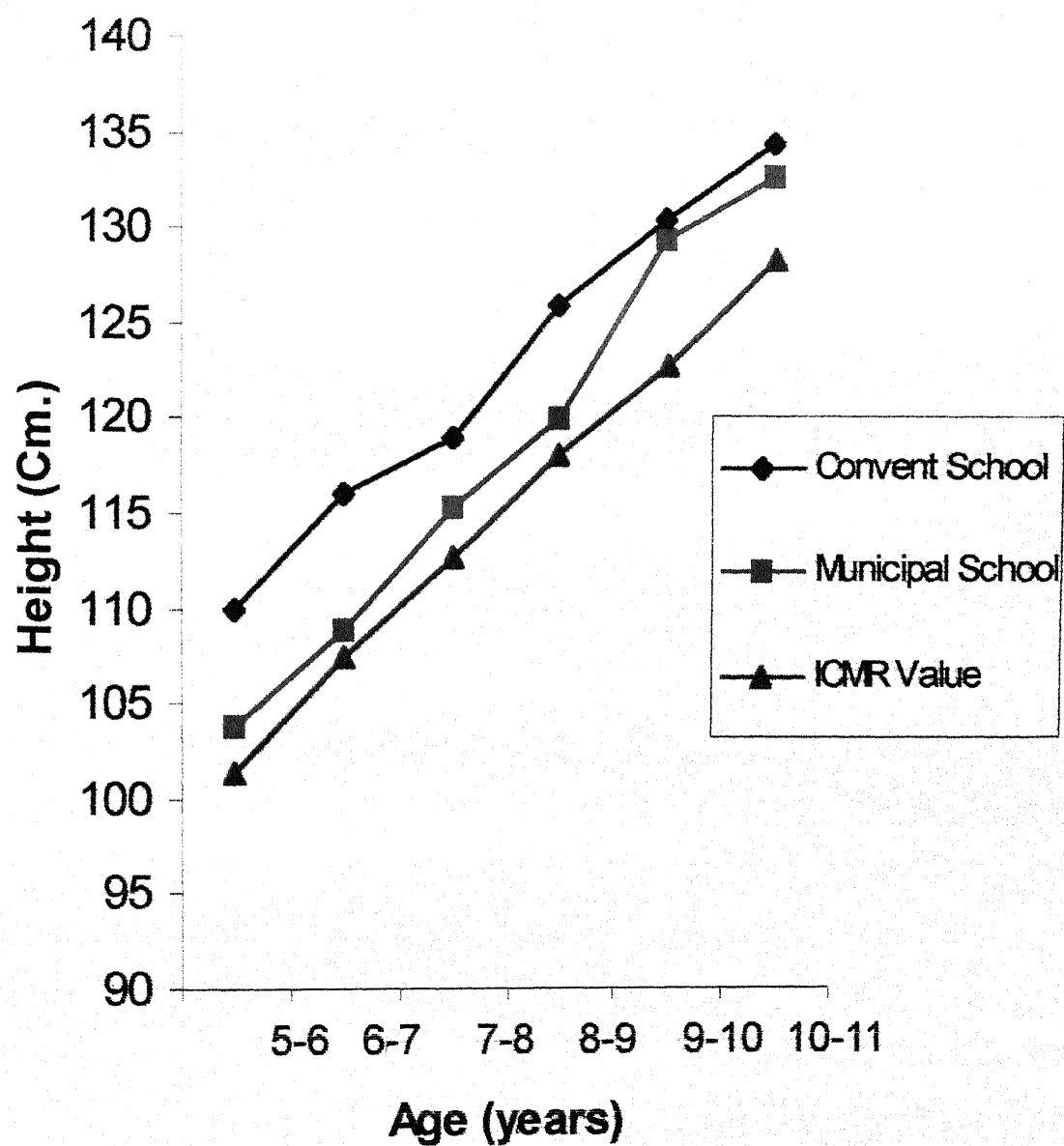


TABLE - XIV

Mean mid-upper arm circumference of boys of convent and municipal school in comparison with ICMR values and Wolanski Standard

Age (In Years)	Municipal School (n=453)			Convent School (n=387)		
	Mean Mid-Arm Circumference (in cm)	ICMR Standard	Wolanski Standard	Mean Mid-Arm Circumference (in cm)	ICMR Standard	Wolanski Standard
5 - < 6	14.3 (\pm 1.0)	13.6	15.7	15.5 (\pm 0.8)	13.6	15.7
6 - < 7	15.9 (\pm 1.2)	14.9	17.5	16.7 (\pm 1.5)	14.9	17.5
7 - < 8	16.0 (\pm 1.3)	14.9	18.1	16.9 (\pm 1.5)	14.9	18.1
8 - < 9	17.1 (\pm 1.7)	14.9	18.7	17.8 (\pm 0.5)	14.9	18.7
9 - < 10	18.5 (\pm 1.5)	16.5	19.3	18.9 (\pm 1.5)	16.5	19.3
10 - < 11	19.1 (\pm 1.2)	16.5	20.0	19.5 (\pm 1.2)	16.5	20.0

(Figure in brackets are S.D.)

In both types of schools mean mid-arm circumference of boys was found to be higher than ICMR Standards but did not come upto the Wolanski Standard. Table also indicates that mean mid arm circumference of boys of convent schools were higher when compared to their counterparts in municipal schools.

TABLE – XV

Mean mid-upper arm circumference of girls of convent and municipal school in comparison with ICMR values and Wolanski Standard

Age (In Years)	Municipal School (n=453)			Convent School (n=387)		
	Mean Mid-Arm Circumference (in cm)	ICMR Standard	Wolanski Standard	Mean Mid-Arm Circumference (in cm)	ICMR Standard	Wolanski Standard
5 - < 6	16.2 (\pm 1.2)	13.6	15.6	15.6 (\pm 1.0)	13.6	15.6
6 - < 7	15.0 (\pm 1.0)	14.9	17.5	16.2 (\pm 1.3)	14.9	17.5
7 - < 8	16.1 (\pm 1.1)	14.9	18.1	17.1 (\pm 1.2)	14.9	18.1
8 - < 9	16.6 (\pm 1.0)	14.9	18.7	17.5 (\pm 1.8)	14.9	18.7
9 - < 10	17.1 (\pm 1.2)	16.5	19.5	18.1 (\pm 1.5)	16.5	19.5
10 - < 11	18.2 (\pm 1.2)	16.5	20.3	18.5 (\pm 1.5)	16.5	20.3

(Figure in brackets are S.D.)

The mean mid-arm circumference of girls from both type of schools had higher values than ICMR standards but did not come upto the Wolanski standard. Convent school girls had a slightly higher mean mid-arm circumference than their counterparts in municipal schools.

Table – XVI

Showing distribution of children according to nutritional deficiencies disorder

Nutritional deficiency disorder	Municipal school (n=453)				Convent School (n=455)				Total (n=840)	
	Boys	Girls	No.	%	Boys	Girls	No.	%	No	%
<u>Vitamin A Deficiency</u>										
(a) Night blindness	5	2	7	1.54	1	-	1	0.25	8	0.95
(b) Conjunctival xerosis	6	2	8	1.76	-	-	-	-	8	0.95
(c) Bitot's spot	3	2	5	1.10	-	-	-	-	5	0.59
(d) Corneal xerosis	1	-	1	0.22	-	-	-	-	1	0.11
$X^2 = 1.86 \text{ df} = 1, p > 0.05$										
<u>Vitamin B. Complex deficiency :</u>										
(a) cheilosis	17	21	38	8.39	4	4	8	2.07	46	5.47
(b) Angular stomatitis	43	29	72	15.89	12	11	23	5.94	95	11.30
(c) Red & raw tongue	7	4	11	2.43	4	3	7	1.81	18	2.14
(d) Fissured tongue	4	8	12	2.64	3	1	4	1.03	16	1.90
(e) Geographic tongue	3	1	4	0.88	1	1	2	0.52	6	0.71
(f) Atrophic papillae	3	4	7	1.54	2	1	3	0.78	10	1.91
$X^2 = 5.73 \text{ df} = 3, p > 0.05$										
<u>Vitamin C. deficiency :</u>										
(a) Bleeding gums	8	11	19	4.19	4	2	6	1.55	25	2.98
(b) spongy gums	15	17	32	7.06	10	8	18	4.65	50	5.95
$X^2 = 1.11 \text{ df} = 1, p > 0.05$										
<u>Vitamin D. deficiency :</u>										
(a) Knock knee	5	7	12	2.64	3	1	4	1.03	16	1.90
(b) Bow legs	3	3	6	1.32	2	1	3	0.78	9	1.07
(c) Beading of ribs	1	-	1	0.22	-	-	-	-	1	0.11
$X^2 = 0.078 \text{ df} = 1, p > 0.05$										
Pallor (Anemia)	35	60	95	20.97	25	33	58	14.99	153	18.21
Discolouration of hair	31	32	63	13.90	2	4	6	1.50	69	8.21

Signs of nutritional deficiency disorders showed a higher prevalence in municipal school children than convent school children but this difference was not found to be statistically significant. Signs of vitamin A deficiency was observed in 4.62% of municipal school children and 0.25% of convent schools children. Similarly signs of vitamin B complex, vitamin C and vitamin D deficiency was 31.77% 11.22% and 4.18% in municipal school children as compared to 5.73%, 6.2% and 1.81% respectively in convent school children. Clinical Anemia was seen in 20.97% of municipal schools children and 14.99% of convent schools children.

TABLE - XVII

Morbidity pattern as observed clinically

Name of disorder	Municipal School (n = 453)				Convent School (n = 387)				Total (n = 840)	
	Boys	Girls	Total	%	Boys	Girls	Total	%	No.	%
Diseases of:										
(a) Cardiovascular System	-	1	1	0.22	-	-	-	-	1	0.11
(b) Central Nervous System	2	-	2	0.44	-	-	-	-	2	0.23
(c) Respiratory System	36	28	64	14.12	23	21	44	11.36	108	12.85
(d) GIT	35	46	81	17.88	28	32	60	15.50	141	16.78
(e) Genitourinary System	2	6	8	1.76	1	-	1	0.26	9	1.07
(f) Skeletal System	18	15	33	7.28	16	13	29	7.49	62	7.38
(g) Skin disease	127	148	275	60.70	23	21	44	11.36	319	37.93
(h) Eye disease	42	59	101	22.2	16	26	42	10.85	143	17.02
(i) E.N.T. diseases	43	38	81	17.88	25	24	49	12.66	130	15.47
(j) Dental disorder	70	40	110	24.28	53	35	88	22.73	198	23.57
(k) Speech defects	8	9	17	3.75	2	-	2	0.52	20	2.38
(l) Behaviour problems	9	5	14	3.09	4	2	6	1.55	20	2.38
(m) Lymphadenopathy	4	7	11	2.42	3	2	5	1.29	16	1.90
Total			799				370		1169	
Average disorders per child			(1.76)				(0.95)		(1.39)	

Skin disease was the commonest disorder observed in the present study (37.97 %) followed by dental disorder (23.57 %). Skin infections were more prevalent in children of municipal school. Diseases of eye, ear and behaviour problem were also found to be more in them while disorders of respiratory system, cardiovascular system, genito-urinary system and skeletal system were found to be equally prevalent in both groups.

Average number of disorder per child was found to be 1.76 in municipal school and 0.95 in convent school children.

TABLE - XVIII*Showing distribution of children according to system-wise morbid conditions*

Systemic disorder	Municipal School (n = 453)				Convent School (n = 387)				Total (n = 840)	
	Boys	Girls	No.	%	Boys	Girls	No.	%	No.	%
<u>Cardiovascular System</u>	-	1	1	0.22	-	-	-	-	1	0.11
Murmur										
<u>Respiratory System</u>										
Upper respiratory tract infection	24	26	50	11.13	21	18	39	10.07	89	10.59
Pneumonia	4	7	11	2.42	-	2	2	0.52	13	1.55
Bronchial Asthma	2	1	3	0.66	3	-	3	0.78	06	0.71
Pulmonary tuberculosis	2	2	4	0.88	-	1	1	0.26	05	0.59
<u>Gastrointestinal System:</u>										
Diarrhoea	15	18	33	7.28	8	12	20	5.17	53	6.31
Worm infestation	32	22	54	11.92	20	18	38	9.81	92	10.95
Jaundice	3	2	5	1.10	-	-	-	-	05	0.59
Acid peptic disease	2	4	6	1.32	-	2	2	0.52	08	0.95
Hepatomegaly	2	1	3	0.66	-	-	-	-	03	0.36
Splenomegaly	-	1	1	0.22	-	-	-	-	01	0.11
<u>Genitourinary System:</u>										
Chronic U.T.I.	1	5	6	1.32	1	-	1	0.26	07	0.83
Undescended testis	2	-	2	0.44	-	-	-	-	02	0.24
<u>C.N.S.</u>										
Poliomyelitis	1	-	1	0.22	-	-	-	-	01	0.12
<u>Skeletal System</u>										
Flat feet	12	21	33	7.28	12	7	29	7.49	62	7.38
<u>Lymphadenopathy</u>										
Cervical	5	4	9	1.98	2	5	7	1.81	16	1.90
Axial	4	6	10	2.20	2	3	5	1.29	15	1.79
Thyroid	3	1	4	0.88	3	-	3	0.78	7	0.83
Paratid	1	-	1	0.22	-	1	1	0.26	2	0.24

Amongst the Gastrointestinal system, worm infestation was the most prevalent disorder in municipal school children. Prevalence of Diarrhoea was 7.28% in municipal school children and 5.17% in convent school children.

Prevalence of upper respiratory tract diseases was high in more in both municipal and convent schools children. Whereas prevalence of pneumonia was found 2.42% in municipal school and 0.52% in convent school children.

Lymphadenopathy was present in 5.28% cases in municipal school children and 4.14% in convent schools. 0.22% children of municipal school were found to be afflicted with polio as compared to none in convent schools. Flat feet were found to be prevailing almost equally in both groups. 12.91% children had disorder of the respiratory system, 7.38% had disorder of skeletal system and 1.07 % had disorder of genito-urinary system.

Table – XIX

Table showing distribution of children according to various skin diseases

Skin diseases	Municipal school (n=453)				Convent School (n=387)				Total (n=840)	
	Boys	Girls	No.	%	Boys	Girls	No.	%	No.	%
Pyoderma	48	25	73	16.11	6	7	13	3.35	86	10.23
Pediculosis	22	38	60	13.24	2	6	8	2.06	68	8.09
Dryness of skin	18	31	49	10.81	6	4	10	2.58	59	7.02
Dermatitis	14	19	33	7.28	-	1	1	0.25	34	4.04
Phrynoderma	12	16	28	6.18	-	1	1	0.25	29	3.45
Prickly heat	9	12	21	4.63	4	7	11	2.84	32	3.80
Tinea & Fungus	3	2	5	1.10	-	-	-	-	5	.059
Scabies	3	1	4	0.88	-	-	-	-	4	0.47
Leucoderma	2	-	2	0.44	-	-	-	-	2	0.24
Total	131	144	275	60.67	18	26	44	11.33	9	37.93

Above table depicts distribution of children according to various skin diseases. Children suffering from diseases of the skin was 37.93%. Pyoderma (10.23%) was the most prevalent skin diseases among school children. Pediculosis was found in 13.24% in municipal school children as compared to 2.06% in convent school children. Scabies was detected in 0.88 % in municipal school children. On statistical analysis difference between skin diseases among municipal schools and convent schools children was found to be significant ($\chi^2 = 19.60$, $df = 7$, $P < 0.05$).

Table – XX*Showing distribution of children according to dental disorder*

Dental disorder	Municipal school (n=453)				Convent School (n=387)				Total (n=840)	
	Boys	Girls	No.	%	Boys	Girls	No.	%	No.	%
Mottled enamel	32	24	56	14.47	17	8	25	5.51	81	9.64
Caries	13	9	22	5.66	18	4	22	4.85	44	5.22
Malocclusion	7	5	12	3.10	13	9	22	4.85	34	4.04
Missed	5	3	8	2.0	7	5	12	2.64	20	2.38
Enamel erosion	1	3	4	1.0	1	-	1	0.22	5	0.59
Filled	2	-	2	0.51	2	3	5	1.10	7	0.83
Pyorrhoea	2	3	5	1.24	-	-	-	-	5	0.59
Enamel hypoplasia	-	1	1	0.25	1	-	1	0.22	2	0.23
Total	62	48	100	28.23	59	29	88	19.39	198	23.52

Total prevalence of dental disorder amongst the school children was 23.52 %. Mottled enamel was the most frequently observed disorder and accounts for 9.64 %. Mottling of teeth were present in 14.47% of municipal school children as compared to 5.51% in convent school children. Dental caries (5.66%), enamel erosion (1.0%), pyorrhoea (1.24%) were more prevalent in municipal school children. On statistical analysis the difference between dental disorders among municipal schools and convent schools children was found to be significant ($\chi^2 = 12.68$, $df = 4$, $P < 0.05$).

Table – XXI*Showing distribution of children according to ophthalmic disorders*

Ophthalmic disorder	Municipal school (n=453)				Convent School (n=387)				Total	
	Boys	Girls	No.	%	Boys	Girls	No.	%	No.	%
Conjunctivities	24	32	56	14.47	6	10	16	3.53	72	8.5
Defective vision	12	7	19	5.0	11	9	20	4.41	39	4.64
Stye	4	3	7	1.60	-	2	2	0.44	9	1.0
Strabismus	4	2	6	1.55	3	-	3	0.66	9	1.0
Corneal opacity	2	1	3	0.77	1	-	1	0.22	4	0.47
Epicanthus	3	1	4	1.0	-	-	-	-	4	0.47
Ptosis	2	1	3	0.77	-	-	-	-	3	0.35
Total	52	49	101	25.93	21	21	42	9.26	143	16.78

Of the total children studied, ophthalmic disorders were observed in 16.78%, in which conjunctivitis was the most common (8.5%). In municipal schools total prevalence of eye diseases was 25.93%, whereas in convent school it was 9.26%. on statistical analysis the difference was found to be significant ($\chi^2 = 14.15$, $df = 4$, $p < 0.05$).

TABLE - XXII*Showing distribution of children according to E.N.T. disorder*

E.N.T. disorder	Municipal School (n = 453)				Convent School (n = 387)				Total (n = 840)	
	Boys	Girls	No.	%	Boys	Girls	No.	%	No.	%
Tonsillitis	5	6	11	2.43	15	16	31	8.01	42	5.00
Acute and chronic nasopharyngitis	9	12	21	4.64	5	3	8	2.06	29	3.45
Sore throat (pharyngitis)	6	4	10	2.21	5	4	9	2.33	19	2.26
Wax in Ear	13	10	23	5.07	1	1	2	0.52	25	2.97
Defective hearing	3	2	5	1.10	-	1	1	0.25	6	0.71
Otorrhoea	7	4	11	2.43	1	-	1	0.25	12	1.43
Total	43	38	81	17.88	27	25	52	13.42	133	15.82

Out of total children studied overall prevalence of E.N.T. disorder was 15.82%, in which tonsillitis was most common (5.0%). E.N.T. disorders were 17.88% and 13.42% in municipal and convent school children respectively.

Prevalence of tonsillitis was higher (8.01 %) in convent school children as compared to (2.43%) in municipal school children. Otorrhoea was present in 2.43 % of municipal school children and 0.25 % of convent school children. On statistical analysis the difference between E.N.T. disorder among municipal schools and convent schools children was found to be highly significant ($\chi^2 = 32.44$, $df = 5$, $p < 0.001$).

TABLE – XXIII*Showing distribution of children according to speech defects*

Speech	Municipal School (n = 453)				Convent School (n = 387)				Total (n = 840)	
	Boys	Girls	No.	%	Boys	Girls	No.	%	No.	%
Normal	235	209	444	98.01	261	119	380	98.12	824	99.08
Stammering	5	6	11	2.42	3	2	5	1.29	16	1.90
Lalling	2	-	2	0.44	-	-	-	-	2	0.23
Staccato	1	-	1	0.22	-	-	-	-	1	0.12
Slurring	3	2	5	1.10	2	-	2	0.51	7	0.83

Of the total children studied 99.08 % had normal speech. Stammering was present in 2.42 % of municipal school children and 1.29 % of convent school children. Staccato was present in only 0.12 % of total children. On statistical analysis, the difference was found to be significant ($\chi^2 = 3.89$, $df = 1$, $p < 0.05$).

TABLE – XXIV*Showing distribution of children according to behavioural disorder*

Behavioural disorder	Municipal School (n = 453)				Convent School (n = 387)				Total (n = 840)	
	Boys	Girls	No.	%	Boys	Girls	No.	%	No.	%
Thumb Sucking	9	13	22	4.85	4	3	7	1.80	29	3.45
Nail Biting	27	22	49	10.81	19	15	34	8.78	83	9.88
Bed Wetting	5	4	9	1.98	5	2	7	1.80	16	1.90
Backwardness in studies	17	19	36	7.99	4	5	9	2.32	45	5.35
Total	58	58	116	25.58	32	25	57	14.70	173	20.58

Behaviour problems were observed in 20.58 % of total children. Thumb sucking was present in 4.85 % of municipal school children as compared to 1.80% children of convent school. Among the behaviour problems nail biting was the most frequently observed (9.88%) disorder. Municipal school children had a higher percentage (7.99%) of children who were backward in studies as compared to their peers (2.32%) in convent school. On statistical analysis, the difference was not significant ($\chi^2 = 6.54$, $df = 3$, $p > 0.05$).

TABLE – XXV

*Showing distribution of children by IQ
in Convent and Municipal Schools*

I.Q.	Municipal School (n=96)				Convent School (n=114)				Total(n=210)	
	Boys	Girls	No.	%	Boys	Girls	No.	%	No.	%
65 – 74	9	8	17	77.27	3	2	5	22.73	22	10.48
75 – 80	6	5	11	73.33	3	2	5	33.33	15	7.14
81 – 90	9	6	15	57.69	5	5	10	38.46	26	12.38
91 – 100	11	10	21	61.76	7	6	13	38.24	34	16.19
101 – 110	6	6	12	48.00	7	6	13	52.00	25	11.90
111 – 119	8	7	15	39.47	12	11	23	60.52	38	18.10
120 – 125	1	1	2	11.76	8	7	15	88.24	17	8.09
126 – 130	2	1	3	9.09	16	14	30	90.90	33	0.16

IQ was tested in 210 students of which 114 children were from convent schools and 96 children from municipal schools. Of the 37 children with IQ levels of 65 – 80, 75.30 % belonged to municipal schools and rest (28.03 %) were from convent schools. In a total of 50 children with higher IQ level (120 – 130), 89.57 % belonged to convent school. Highly significant association was found between IQ levels and type of schools ($\chi^2 = 45.03$, $df = 7$, $p < 0.001$).

TABLE – XXVI*Showing IQ and sex wise distribution of children*

I.Q.	Municipal School (n=96)						Convent School (n=114)					
	Boys	%	Girls	%	Total	%	Boys	%	Girls	%	No.	%
65 – 74	9	52.94	8	47.06	17	17.71	3	60.00	2	40.00	5	4.39
75 – 80	6	54.54	5	45.45	11	11.46	3	60.00	2	40.00	5	4.39
81 – 90	9	60.00	6	40.00	15	15.63	5	50.00	5	50.00	10	8.77
91 – 100	11	52.38	10	47.62	21	21.88	7	53.85	6	46.15	13	11.40
101 – 110	6	50.00	6	50.00	12	12.50	7	53.85	6	46.15	13	11.40
111 – 119	8	53.33	7	46.67	15	15.63	12	52.17	11	47.83	23	20.18
120 – 125	1	50.00	1	50.00	2	2.08	8	53.33	7	46.67	15	13.16
126 – 130	2	66.67	1	33.33	3	3.13	16	53.33	14	46.66	30	26.31
Total	52	54.67	44	45.83	96	100.00	61	53.50	53	46.49	114	100.00

Above table depicts IQ level of all 210 children separately for males and females. Of the total of 96 children of municipal school 21 (21.87 %) had IQ below 100, 11(11.43 %) children below 80, 17(17.70 %) below 74 and 2(2.08 %) children had IQ above 120. Similarly IQ was tested in 114 of convent school children. 13 (11.40 %) children had IQ below 100 and 5 (4.38 %) below 74. 30 (26.31 %) children had IQ between 126 – 130. The difference in IQ levels of male and female children was statistically not significant ($\chi^2 = 9.25$, $df = 6$, $p > 0.05$).

TABLE – XXVII

*Showing distribution of children by IQ and Socio-economic status
(Modified Prasad Classification updated 1998-99)*

I.Q.	Social Class					Total	%
	I	II	III	IV	V		
65 – 74	3	2	3	3	11	22	10.47
75 – 80	2	3	2	4	4	15	7.14
81 – 90	2	3	5	8	8	26	12.38
91 – 100	3	5	11	10	5	34	16.19
101 – 110	7	6	6	2	4	25	11.90
111 – 119	13	9	8	2	6	38	18.09
120 – 125	8	3	1	2	3	17	8.09
126 – 130	13	9	5	4	2	33	15.71
Total	51	40	41	35	43	210	100.0

Of the total children studied higher value of IQ (120 – 130) was seen in 23.8 % of children. Children belonging to social class I had higher value of IQ. Children of social class (IV and V) had lower value of IQ. On statistical analysis it was found that higher IQ can be associated with upper socio-economic status ($\chi^2 = 31.18$, $df=7$, $p < 0.001$).

TABLE - XXVIII*Showing distribution of children by IQ & various grades of malnutrition*

I.Q.	No. Of Children	Normal		Malnourished							
				Grade I		Grade II		Grade III		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%
65-74	22	3	13.36	6	27.27	7	31.82	5	22.72	18	81.81
75-80	15	4	26.67	3	20.00	5	33.33	3	20.00	11	73.33
81-90	26	11	42.30	8	30.77	5	19.23	2	7.69	15	57.69
91-100	34	20	58.82	11	34.37	12	35.29	-	-	23	67.64
101-110	25	12	48.00	8	32.00	4	16	1	4.0	13	52.00
111-119	38	27	71.05	6	15.79	3	7.89	1	2.63	10	26.32
120-125	17	14	82.35	2	11.76	2	11.76	-	-	4	23.52
126-130	33	18	54.55	4	12.12	1	3.03	2	6.06	7	21.21
Total	210	109	51.90	46	21.90	39	18.57	14	6.66	101	48.09

The above table indicates that IQ of malnourished children was found to decrease with the degree of malnutrition out of 210 children studied 51.90 % children had normal nutrition status while 21.90 % children had grade I, 18.57 % had grade II and 6.66 % children had grade III degree of malnutrition. The IQ malnourished children was found to be decrease with the degree of malnutrition. It was found that higher IQ can be associated with nutrition status. ($\chi^2 = 16.28$, $df = 6$, $p < 0.05$).

TABLE - XXIX*Showing distribution of children by IQ and literacy status of father*

I.Q.	Total Number	Professional & Graduates		Inter & High School		Middle & Primary School		Illiterate	
		No.	%	No.	%	No.	%	No.	%
65 - 74	22	02	9.09	03	13.63	07	31.82	09	40.91
75 - 80	15	03	20.00	04	26.66	05	33.33	03	20.00
81 - 90	26	08	30.77	04	15.38	10	38.46	06	23.07
91 - 100	34	10	29.41	07	20.59	09	26.47	08	23.53
101 - 110	25	13	52.00	06	24.00	05	20.00	02	8.00
111 - 119	38	16	42.11	10	26.31	06	15.79	05	13.16
120 - 125	17	06	35.29	05	29.41	03	17.64	02	11.76
126 - 130	33	22	66.66	07	21.21	03	9.09	01	3.03
Total	210	80	38.09	46	21.90	48	22.86	36	17.14

Of the total 210 children studied fathers of 38.09 % children were graduates/professionals, 21.90 % were studied upto Inter and High School, 22.86 % were middle and primary and 17.14 % were illiterate. Children with graduate or professional fathers had a higher IQ level. Children with illiterate father were showing lower level of IQ. On statistical analysis, it was found that there is a highly significant association between literacy of father and IQ of children ($\chi^2 = 18.24$, $df = 3$, $p < 0.001$).

TABLE - XXX*Showing distribution of children by IQ and literacy status of mother*

I.Q.	Total Number	Professional & Graduates		Inter & High School		Middle & Primary School		Illiterate	
		No.	%	No.	%	No.	%	No.	%
65 - 74	22	01	4.55	02	9.09	08	36.36	10	45.45
75 - 80	15	01	6.66	02	13.33	08	53.33	05	33.33
81 - 90	26	01	3.85	07	26.92	07	26.92	11	42.31
91 - 100	34	02	5.88	08	23.52	10	29.41	15	44.12
101 - 110	25	08	32.00	05	20.00	04	16.00	08	32.00
111 - 119	38	17	44.74	06	15.79	05	13.16	10	26.32
120 - 125	17	08	47.05	03	17.65	03	17.65	02	11.76
126 - 130	33	27	81.82	03	9.09	01	3.03	02	5.06
Total	210	65	30.95	36	17.14	46	21.90	63	30.00

30.95 % children had graduates/professional mother, mothers of 17.14 % of children were studied upto Inter and High School, 21.90 % had completed middle and primary education and 30.00 % children had mother who were illiterate. There is direct relationship between IQ of children and maternal literacy. On statistical analysis, it was found that literacy status of mothers had an effect of IQ of their children ($x^2 = 25.47$, $df = 5$, $p < 0.001$).

TABLE - XXXI*Showing distribution of children by IQ and height*

I.Q.	Total Number	Height more than 90% of the Harvard standard		Height less than 90% of the Harvard standard	
		No.	%	No.	%
65 - 74	22	15	68.18	07	31.82
75 - 80	15	10	66.66	05	33.08
81 - 90	26	20	76.92	06	23.08
91 - 100	34	21	61.76	13	35.14
101 - 110	25	21	84.00	04	16.00
111 - 119	38	27	71.05	11	28.95
120 - 125	17	14	82.35	03	17.64
126 - 130	33	27	81.81	06	18.18
Total	210	155	73.80	55	26.19

The standard height for age was taken as 50th %ile of the Harvard Standard. Of the total 210 children studied, 155 (73.80 %) had their height more than 90 % of the standard height and 55 children (26.19 %) had their height less than 90 % of standard. There was no marked difference in IQ levels of children when classified according to their height. The difference was not found statistically significant ($\chi^2 = 2.14$, $df = 5$, $p > 0.05$).

TABLE – XXXII*Showing distribution of children by IQ and school performance*

I.Q.	Total Number	Promoted		Failed	
		No.	%	No.	%
65 – 74	22	14	63.63	08	36.36
75 – 80	15	10	66.67	05	33.33
81 – 90	26	21	80.77	05	19.23
91 – 100	34	32	94.12	02	5.88
101 – 110	25	23	92.00	02	8.00
111 – 119	38	37	97.37	01	2.63
120 – 125	17	16	94.12	01	5.88
126 – 130	33	33	100	-	-
Total	210	186	88.57	24	11.42

The above table indicates that with higher levels of IQ, the %age of children getting promoted was more and number of children flailing, decrease. The association between school performance of children and their IQ levels was found highly significant. ($\chi^2 = 29.52$; $df = 3$, $p < 0.001$).

TABLE – XXXIII*Distribution of Schools by environment*

	Basic D.C. Talpura	Arya Kanya Inter College Sipri Bazar	Christ the King Primary School	Kendriya Vidhyalaya Jhansi Cantt.
Type	Hindi Medium	Hindi Medium	English Medium	English Medium
Location	Talpura	Sipri Bazar	19, Civil Lines	Jhansi Cantt.
Site	Behind Evert Market	Near City Market	Behind Distt Jail	Open Cantonment
Surrounding environment	Unhygienic	Unhygienic	Hygienic	Hygienic
Structure	Single storied	Single storied	Double storied	Double storied
Average size of class rooms	20 x 20 feet	15 x 24 feet	20 x 24 feet	22 x 24 feet
Average no. of children in class	60	40	60	40
Distance of black board from seats	4 feet	5 feet	5 feet	5 feet
Type of furniture in class room	None	None	Wooden desks and chairs	Wooden desks and chairs
No. of windows	2	2	2	2
Distance of windows from floor space	3 feet	3 feet	3 feet	3 feet
Cross ventilation	Present	Present	Present	Present
No. of ventilators	2	4	2	2
No. of doors	2	1	1	2
Ventilation	Not adequate	Adequate	Adequate	Adequate
Colour of walls of class room	Yellow	Dirty Yellow	White	White
Natural light	Not enough	Not enough	Enough	Enough
Artificial light	None	None	Present	Present
Water Supply :	Not Safe	Not Safe	Safe	Safe
Continuity	Stored water	Stored water	Continuous	Continuous
Distribution by Taps	Not present	Not present	Present	Present
Other sources	Hand pump	Hand pump	Water cooler	Water cooler
Mid-day meals	Provided	Not provided	Not provided	Not provided
Vendors	Allowed	Allowed	Not allowed	Not allowed
Urinals	Not adequate	Not adequate	Adequate	Adequate
Latrines	Not adequate	Not adequate	Adequate	Adequate
Playground	Present	Present	Present	Present
First aid and emergency facilities	None	Present	Present	Present
Recreation facilities	None	None	Present	Present
Health education classes	Not held	Not held	Held	Held

School Environment :

Convent Schools

A total of 387 students aged 5-11 years were included from Kendriya Vidhalaya and Christ the King School. These school were of english medium and located in hygiene surrounding. Type of furniture in these school were wooden and the class room were adequate in number with proper ventilation and natural lights. Continuous supply of safe drinking water from taps and motor pumps was there. Urinals and latrines were sufficient in number and provided with septic tanks.

In Christ the King School mid-day meals were provided. Urinals and latrines were sufficient in number and provided with septic tanks. These schools were provided with library, play grounds, recreation facilities and computer classes for class 3rd and 4th. First aid and emergency services are provided in both the schools.

Municipal Schools

453 children from Basic D.C. School and Arya Kanya Inter College were studied. These schools were surrounded by unhygienic locality. Number of class rooms were insufficient and had poor ventilation, poor natural light and no electricity. There was no furniture and children sit on floor mats. Water supply is from hand pumps and taps. In Arya Kanya Inter College mid-day meals were not provided while in Basic D.C. School mid-day meal in the form of wheat (3 kg/month to each child) was provided. There was no library, recreation facilities, first-aid in these schools. No health education classes were held.

DISCUSSIONS

DISCUSSION

In the present study a total of 840 children aged 5 to 11 years were surveyed in different schools of Jhansi. 453 students were examined from municipal schools and 387 children from convent schools.

Of the total 840 children surveyed 52.98 percent were male and the rest of the 47.02 percent were female. Number of children studied in each school were almost equal.

Of the total children studied, children belonging to scheduled caste 10.0 percent, backward caste 33.0 percent and others 56.90 percent. 80.36 percent of children in convent schools belonged to others class as compared to 36.87 percent in municipal school. 2.06 percent children belonged to scheduled caste, 17.57 percent to backward class in convent schools as compared to 16.77 percent, 46.35 percent respectively in municipal schools. Mullick et al (1991) reported that 56.18 percent belonged to upper caste and remaining to scheduled (28.96 percent) and backward caste (14.84 percent). 92.30 percent of children in convent schools belonged to upper class and 7.70 percent to scheduled and backward classes. In municipal schools only 5.71 percent children were from upper class and 94.24 percent belonged to scheduled and backward classes.

Of the total children surveyed, hindu children formed a majority (70.95 percent), rest of them belonged to muslim (21.92 percent) and other religion (7.14 percent). In municipal schools 38.85 percent children were muslim as compared to 2.06 percent in convent schools. Mullick et al (1991) reported that hindu children formed a 80 percent of total children examined. The remaining belonged to muslim (16.68 percent) and other religions (2.74

percent). There were 33.7 percent muslim children in municipal schools as compared to only 4.6 percent in convent schools.

3.33 percent of fathers and 33.69 percent of mothers were illiterate. 56.58 percent of children of convent schools had father who were educated upto intermediate as compared to 35.50 percent in municipal schools. 60.92 percent of mothers and 5.51 percent of fathers in municipal schools were illiterate as compared to 1.80 percent mother and 0.78 percent fathers in convent school, it was because of poverty, ignorance and lack of opportunity. Mullick et al (1991) observed that fathers of 10.81 percent children were illiterate and 47.75 percent had professional/graduate fathers. Children having illiterate mothers were 25.02 percent and 30.61 children had mothers who were professional/graduate.

Fathers of 48.09 percent children were in service/business, 22.02 percent were in agriculture and 28.93 percent were labourer/skilled worker. In convent schools 78.03 percent had fathers who were in service and 21.96 percent had fathers who were in business. In municipal schools 30.02 percent had fathers in agriculture, 16.77 percent were labourer and 36.86 percent were skilled worker and only 3.75 percent had father who were in business. Mothers of 81.07 percent children were housewives/agriculture. In convent school 71.83 percent of children had mothers who were housewives/agriculture as compared to 88.96 percent in municipal school. Mullick et al (1991) observed that fathers of 30.96 percent children and mothers of 18.05 were in service. 34.64 percent children had fathers in business. Rest 34.91 percent had fathers who were in agriculture, labourer and in skilled jobs. Mothers of 53.84 percent children were housewives and rest were labourer and skilled worker (14.57 percent).

39.29 percent children were from social class I, 5.83 percent from social class II, 27.78 percent from social class III, 25.83 percent from social class IV and 7.26 percent children from social class V. 85.27 percent children from convent schools belonged to social class I and only 14.72 percent belonged to social class II and III. In convent schools there was no child belonging to social class IV and V while in municipal schools 38.63 percent children belonged to social class III, 48.0 percent from social class IV and 13.46 percent from social class V. Mullick et al (1991) reported that 53.07 percent children belonged to social class I and remaining to social class II (4.12 percent), social class III (15.57 percent), social class IV (23.09 percent) and social class V (8.43 percent). In convent schools, most of the children (91.03 percent) belonged to social class I and only 9 percent to social class II and III. In municipal schools 76.21 percent belonged to social class IV and V and the remaining 35.16 percent belonged to social class III. This figures is similar with that of a present study.

36.07 percent children had good personal hygiene, 27.97 percent had fair and 35.95 percent had poor personal hygiene. 66.66 percent had poor personal hygiene in municipal school children, while fair personal hygiene was observed in 33.33 percent of children. In contrast, 78.29 percent of children in convent school had good personal hygiene and 21.70 percent had fair personal hygiene. Dhar et al (1979) observed that the overall personal hygiene was unsatisfactory among 53.7 percent children. Agarwal et al (1999) reported that the common health problems noted in school girls were related to personal hygiene (62.2 percent). The unsatisfactory personal hygiene of municipal school could be due to lack of awareness of value of good hygiene on parts of their parents and their economic backwardness.

61.90 percent of children having vegetarian diet as compared to non-vegetarian 38.09 percent. In both the schools children having vegetarian diet were more than children having non-vegetarian diet. This difference was found to be statistically significant. Similar finding was reported by Mullick et al (1991), vegetarian children were observed in 52.42 percent and non-vegetarian in 47.57 percent of children. The difference was statistically significant ($p < 0.001$).

75.23 percent had BCG scars, 74.28 percent had immunized against Polio and DPT, 57.26 percent against measles, 0.24 percent against measles, mumps, rubella and 0.71 percent against Hepatitis B. Children belonging to municipal school 67.77 had BCG scars and 68.65 percent were immunized against polio and DPT and 45.69 percent against measles. The corresponding percentages were much higher for convent school children, 83.97 percent, 80.88 percent and 70.80 percent. 0.62 percent children against measles, mumps, rubella and 1.5 percent against hepatitis B were immunized in convent schools as compared to none in municipal schools. The low vaccination rates in the municipal school children could be due to illiteracy, ignorance, unawareness of the parents about these vaccine or may be due to unavailability of these vaccine locally for immunization. Patodi et al (1977) observed that the immunization status of school children against BCG was 37.6 percent while immunization against diphtheria, pertusis, tetanus and polio was not satisfactory. Dwivedi et al (1978) reported that BCG coverage in rural and urban area was 28.7 percent and 56.2 percent respectively. Yaima et al (1981) observed that the immunization against BCG was 20.0 percent and against DPT/DT 20.0 percent. Sharma et al (1984) reported that coverage of BCG was higher among hindus (94.40 percent) as compared to Muslims (88.58 percent). Better vaccination

coverage in the present study than the studies carried out previously is due to increase in awareness and better immunization programme.

Mean weight of all male and female children in both types of school had higher value when compared to ICMR standards. It was also observed that mean weight of convent schools boys and girls had higher values than the municipal schools boys and girls for all ages. Similar finding were reported by Malaviya et al (1969); Patodi et al (1977); Dhar et al (1979); Rao et al (1984); Parvathi et al (1991) and Chatterjee et al (1994) whereas Dwivedi et al (1978); Sood and Kochar (1993); Chandla, and Sehgal (1994) and Singh et al (1996) found contrary to the present study. The reason for dissimilarity of the present study with the other study quoted may be due to natural variation as this study performed in different field area and in different socio-economic group.

The average height of all children increased with increasing age in the present study. In case of convent schools children mean height of children aged 5-11 years was higher than ICMR standard. Similar finding were seen in case of municipal school children. The average height of convent school children was higher than the municipal school children. These findings are similar to Malaviya et al (1969); Dhar et al (1979) Rao et al (1984); Bhasin et al (1990); Kumar et al (1990) and Balgir et al (1998). Where as Patodi et al (1977); Dwivedi et al (1978); Parvathi et al (1991) and Chandna and Sehgal (1994) and Singh et al (1996) reported that mean height of children are significantly lower than ICMR value. The lower height values of children could be due to low socio-economic and poor nutritional status.

The mid-arm circumference values of the present study reveals that mean mid-arm circumference values of both boys and girls were found to be higher than ICMR standards but did not come upto the wolanski standard.

Study also reveals that mean mid-arm circumference of children of convent schools was higher when compared to their counterparts in municipal schools for both sexes in all age groups. Dhar et al (1979); Parvathi et al (1991) and Chandna and Sehgal (1994) has also reported similar findings. This suggests the presence of protein gap in the dietary intake of these children under study.

In municipal school children, signs of nutritional deficiencies showed a higher prevalence than convent school children and the difference was found to be statistically significant. Signs of vitamin B complex deficiency and vitamin C deficiency were higher in municipal school children as compared to convent school children. Clinical Anemia was seen in 20.97 percent of municipal school children and 14.99 percent of convent school children. Overall prevalence of clinical anemia was observed in 42.14 percent of total children examined. Higher prevalence of nutritional anemia in municipal school children could be due to lack of green leafy vegetables, milk, fruits and other protective foods in the diet of all these children. Patodi et al (1977) in a study of primary school children reported that iron deficiency anemia accounts for 6.70 percent of total children studied. Dwivedi et al (1978) observed that anemia was present in 11.38 percent of school children. Sharma et al (1984) observed that pallor was seen in 20.56 percent cases with almost equal sex ratio. Indirabai et al (1976) in a study of boys 6-12 years reported that pallor was present in 49.5 percent of boys. The variation in different studies is due to factor viz, utilization of iron, a low dietary intake of iron, high prevalence of parasitism.

Of the nutritional deficiency disorder signs of vitamin A deficiency were observed more in municipal school children. They were 0.25 percent in convent schools children and 4.62 percent in municipal school children.

This can be attributed to poor socio-economic status, poor nutritional intake in municipal school children. Malaviya et al (1964) observed that out of 516 students, signs of vitamin A deficiency was seen in 52.48 percent of children. Of this hyperkeratosis of skin was present in 25.53 percent, bitot's spot in 13.83 percent, corneal xerosis in 3.54 percent, night blindness in 2.83 percent and corneal opacity was seen in 1.77 percent. Patodi et al (1977) reported that prevalence of vitamin A was seen in 11.58 percent of school children. Sharma et al (1984) reported that prevalence of vitamin A was seen in 24.42 percent cases and was more prevalent in children from low socio-economic classes and among children from large sized families. Sharma et al (1991) reported that highest prevalence of bitot's spot (8.5 percent) was seen in boys 6-11 years in Uttar Pradesh and lowest (less than 2 percent) in children of Karnataka. Bapat et al (1992) observed that vitamin A deficiency was present in 16.86 percent of school children. Agarwal et al (1999) observed that signs of vitamin A deficiency were limited to conjunctival xerosis or bitot's spot and none had night blindness. Vitamin A deficiency was seen in 7.2 percent of total children studied. Decreased prevalence of vitamin A deficiency in the present study may be probably due to intense vitamin A deficiency control programme.

In the present study it has been found that vitamin B-complex deficiency in the form of angular stomatitis was the most common manifestation, effecting 15.89 percent children in municipal school and 5.94 percent children in convent schools. The difference in deficiency of vitamin B in municipal and convent schools children can be attributed to poor socio-economic status and poor diet. Patodi et al (1977) reported prevalence of vitamin B-complex in 6.96 percent of students. Sharma et al (1991) reported highest prevalence of angular stomatitis 32.0 percent was seen in boys of Andhra Pradesh and lowest (less than 1.0 percent) in children of

Karnataka. Chhabra et al (1996) reported signs of vitamin B-complex deficiency in the form of cheilosis, angular stomatitis and glossitis were seen in 2.6 percent of boys.

Total prevalence of vitamin C deficiency in the present study was 7.73 percent. Prevalence was 11.25 percent and 6.2 percent in municipal and convent school children respectively. Malaviya et al (1969) reported that the prevalence of spongy and bleeding gums is 11.29 percent.

Vitamin D deficiency signs were seen in 4.18 percent children from the municipal schools and 1.81 percent children from convent schools. The difference was not statistically significant. Sharma et al (1984) reported that vitamin D deficiency was seen in 8.38 percent of cases. Similar results were observed by Dhingra et al (1977), observed 8.1 percent children of corporation school and 2.8 percent children of private school having deficiency of vitamin D. These nutritional deficiencies were more prevalent in the municipal school children because of their diets deficient in calories, vitamins and minerals leading to chronic malnutrition. It can also be attributed to poor environmental conditions, chronic paediatric infections and repeated worm infestations. Their diets were also lacking in green leafy vegetables.

Morbidity pattern as observed clinically in the present study, it was found that skin diseases were the commonest disorder (37.97 percent) followed by dental disorder (23.57 percent). Skin infections were more prevalent in children of municipal school. Diseases of eye, ear and behaviour problems were also found to be more in them. Disorder of respiratory system, cardiovascular system, genitourinary system and skeletal system were found to be equally prevalent in both groups. Average number

of disorder per child was found to be 1.76 in municipal school children and 0.95 in convent school children.

On systemic examination, disorder of GIT were maximum. A total of 19.27 percent of the children had one or the other disorder of gastrointestinal system. Worm infestation was observed in 10.95 percent and diarrhoea in 6.31 percent. Prevalence of GIT disorder was 22.51 percent in municipal school children and 16.04 percent in convent school children. Of this, worm infestation and diarrhoea was found to be more prevalent in municipal school children (11.92 percent and 7.28 percent) than in convent schools children (9.81 percent and 5.17 percent). This may be attributed to poor socio-economic status, poor environmental hygiene, poor personal habits and non availability of soap and insufficient water in case of municipal school children. There is also lack of piped water supply and sanitary latrine in homes of children of municipal schools.

A total of 12.91 percent children had disorders of the respiratory system. Of this 10.59 percent children had upper respiratory tract infections. Disorders of respiratory system were also more prevalent in municipal school children (14.21 percent) as compared to convent school children (11.37 percent). Dhingra et al (1977) observed 5.5 percent children of public school and 7.7 percent children of corporation school had respiratory disorder. Chhabra et al (1996) reported that total prevalence of respiratory tract infection was 8.7 percent of children. Agarwal et al (1999) reported that respiratory disease in the form of bronchial asthma was present in 6.6 percent of children. It was not unexpected, as Mumbai has hot and humid climate with heavy pollution.

Only 0.11 percent of the children examined had disorder of the cardiovascular system. These disorder present in 0.22 percent of municipal

school children. Merchant et al (1975) in a study of children observed that functional murmurs was present in 7.4 percent children, congenital heart diseases in 1.2 percent and constrictive pericarditis in 0.12 percent children. Agarwal et al (1999) reported that cardiac diseases account for 0.5 percent of cases. Among six cardiac lesion, two were rheumatic in origin.

Disorders of genitourinary system were present in 1.07 percent children. Of these 1.32 percent children in municipal school and 0.26 percent children in convent school gave a history of chronic UTI. Undescended testis were observed in only 0.44 percent of municipal school children. Gangadharan (1977) observed that chronic UTI was present in 0.57 percent of children. Dhingra et al (1977) observed 0.6 percent disease of urogenital system in corporation school as compared to nil in public school of Delhi. Sundaram et al (1978) observed undescended testis in 0.1 percent private school children. Agarwal et al (1999) observed that UTI was present in 0.4 percent of cases.

Disorders of CNS and skeletal system in the present study were observed in 7.50 percent children. Of these one child from municipal school (0.22 percent) gave a history of poliomyelitis with residual paralysis of lower extremities. Flat feet was observed in 7.38 percent children. Gangadharan (1977) observed that 0.52 percent children were having musculoskeletal disease (residual polio in 0.13 percent of children). Sundaram et al (1978) observed residual polio in 0.2 percent corporation school children as compared to 0.1 percent in private school. Yaima et al (1981) observed musculo-skeletal disorder in 0.3 percent school children.

Lymphadenopathies were observed in 4.76 percent children, of these, 5.28 percent of children were from municipal school and 4.14 percent children were from the convent school. Patodi et al (1977) observed that the

lymphadenitis accounts for 0.78 percent of total children studied. Gangadharan (1977) in a study of school health service in Kerala observed cervical lymphadenopathy in 2.43 percent of school children. Joseph (1977) observed lymphadenopathy in 2.1 percent of school children. Chhabra et al (1996) observed that lymphadenopathy accounts for 5.2 percent of cases. Rao et al (1984) in a study of rural primary school children observed that 2.6 percent school children had submandibular gland enlargement and 4.0 percent had cervical gland enlargement. Agarwal et al (1999) observed that the cervical lymphadenopathy was present in 1.1 percent of cases. Yaima et al (1981) reported that lymphadenopathy was present in 9.2 percent of total children studied.

37.93 percent children were found to be suffering from skin diseases. Of these, 10.23 percent children had pyoderma, 8.09 percent children had pediculosis, 7.02 percent children had dryness of skin, 4.04 percent children had dermatitis, 3.45 percent had phrynoderma, 3.80 percent had prickly heat, 0.59 percent children had tinea and fungus, 0.47 percent children had scabies and leucoderma was present in 0.24 percent. Skin diseases were found to be significantly more in municipal school children because of overcrowding, lack of personal hygiene, large family size and economic backwardness. Patodi et al (1977) observed that the out of 35.12 percent skin disorders among school children, majority of them suffered from multiple boils (9.37 percent), dermatitis (8.39 percent) and pediculosis (6.38 percent). Sharma et al (1984) observed that the skin diseases were seen in 18.63 percent in urban school children. Chhabra et al (1996) observed in a study that the skin disease was the commonest morbidity. This finding is similar with the present study. Gangadharan et al (1977) reported the prevalence of skin infection as 23 percent in rural school children. Rao et al (1984) reported a prevalence of 12 percent in rural school children. This

difference may be because of living conditions, personal hygiene and climatic variation. Agarwal et al (1999) reported that prevalence of skin infections accounts for 7.0 percent of total children studied.

In the present study ophthalmic disorders were observed in 16.78 percent children. Eye diseases were found to be more (25.93 percent) in municipal school children as compared to (9.26 percent) in convent schools. This may be attributed to poor personal hygiene and lack of knowledge in the former group. Of the total ophthalmic disorder, conjunctivitis was the most prevalent (8.5 percent) followed by defective vision (4.64 percent). Patodi observed conjunctivitis in 7.09 percent children, defective vision in 8.54 percent, sty in 2.80 percent children. Dwivedi et al (1978) reported diseases of eye in rural and urban area were 12.17 percent and 12.37 percent respectively. Yaima et al (1981) reported that total prevalence of eye disease was 6.1 percent.

In the present study E.N.T. disorder were observed in 15.82 percent. Municipal school children showed high prevalence of E.N.T. disorder (17.88 percent) compared to convent school children (13.42 percent). Amongst the E.N.T. disorder tonsillitis was the most prevalent disorder (5.0 percent). Prevalence of tonsillitis was higher (8.0 percent) in convent school children as compared to (2.43 percent) in municipal school children. Otorrhoea was present in 1.43 percent school children. Patodi et al (1977) observed that E.N.T. disorder contributed to 20.68 percent. Dwivedi et al (1978) reported that disease pattern of E.N.T. disorder was almost similar in both rural and urban area and this finding found contrary to present study. Chhabra et al (1996) observed that total prevalence of E.N.T. disorder was 7.8 percent. Yaima et al (1981) reported that prevalence of E.N.T. disorder was 1.7 percent. The reasons for dissimilarity of present study with other

study quoted may be natural variations as this study performed in different field areas.

In this study dental defect were observed in 23.52 percent children, in which 28.23 percent children were from municipal schools and 19.39 percent children were from convent schools. Percentage of mottled enamel, dental caries, enamel erosion and enamel hypoplasia was more in municipal school children (14.47 percent, 5.66 percent, 1 percent and 0.25 percent) as compared to convent school children (5.51 percent, 4.85 percent, 0.22 percent and 0.22 percent). On statistical analysis this difference was found to be significant ($p < 0.05$). Malocclusion was present in 4.04 percent and pyorrhoecia in 0.59 percent of total children. The increase in incidence of dental caries in convent school children can be attributed to the habit of eating in between meals and also more consumption of sweets, chocolates and refined sugar food stuff as compared to children from municipal school.

Sharma et al. (1984) observed that poor dental hygiene was seen in 40.40 percent cases. Mottling of teeth in 8.44 percent, dental caries in 10.44 percent case. Chhabra et al (1996) observed that caries teeth was present in 10.9 percent and periodontal disease in 5.2 percent cases. Venugopal et al (1998) reported dental caries in 35.6 percent cases. Prevalence of caries was low in well nourished children and with vegetarian type of diet. Chhabra et al (1979) reported higher prevalence of caries among higher socio-economic groups whereas Verma et al (1987) reported higher prevalence in low socio-economic group. Ann et al (1991) reported significant association between dental caries and frequency of consumption of sugary food. Agarwal et al (1999) reported dental caries in 61 percent. Rao et al (1993) observed that dental caries was found in 16.5 percent. Periodontal disease were prevalent among children who clean their teeth

with ash, coal and manjan. Ganga et al (1991) reported that 36.4 percent had one or more missing teeth, 1.8 percent had filled teeth. The variation in different studies is due to difference in social, cultural and economic factor.

Behaviour problems were observed in 20.58 percent of children. In the present study, the prevalence of behaviour problems were more in municipal school children (25.58 percent) as compared to convent school (14.70 percent). Nail biting in 10.81 percent, thumb sucking 4.85 percent, and enuresis in 1.98 percent children of municipal school while prevalence of nail biting in 8.78 percent, thumb sucking in 1.80 percent and enuresis in 1.80 percent children of convent school. This variation in both type of school is due to difference in social, cultural, economic factor apart from large family size in municipal school children. Shrivastava et al (1978) observed that number of children having behaviour problems in public school was 31.57 percent and that in govt school was 37.67 percent. Nocturnal enuresis was present in 26.24 percent children and 34.51 percent children respectively. Agarwal et al (1999) observed that behaviour problems are common due to excessive stress, competitiveness, high parental expectations and consequent anxiety. In their study most of problem seen i.e. nail biting, vague aches and pain, thumb sucking etc. indirectly indicate highly stressful and anxiety related behaviour. Reported prevalence of nail biting was present in 6.5 percent, vague aches and pains in 3.4 percent, pica in 3.2 percent, thumb sucking 1.1 percent, nocturnal enuresis 0.8 percent, miscellaneous 0.6 percent of cases.

In the present study the IQ of males was higher than females in both types of schools. But this difference was not statistically significant. Of the total 96 children of municipal schools 21 (21.87 percent) had IQ between 91-100 and 3.12 percent had IQ between 126-130. Similarly in convent

schools children 13 (11.40 percent) had IQ between 91-100 and 30 (26.32 percent) had IQ between \pm (126-130).

9.99 percent children from municipal schools and 8.77 percent children from convent schools had IQ level between 81-90, higher level of IQ (126-130) was observed in 3.31 percent of municipal schools and 26.31 percent of convent schools children. Dhingra et al (1977) reported that mean IQ of public schools children was significantly higher in public schools children.

In the present study it was found that higher level of IQ was seen in children of social class I and II while lower level of IQ was seen in children of social class IV and V. Dhingra et al (1977) reported that children of class I had an IQ between 121-130 where as social class IV had and IQ of 100 or below. Majority of social class III children (83.7 percent) were found having IQ between 91-100.

Higher IQ levels were found in children whose fathers and mothers were graduate and professional. Children of illiterate father and mother were showing lower level of IQ. On statistical analysis this difference was found to be significant. The genetic contribution of father and mother towards the children can be taken as equal and subsequently their influence and association during early childhood.

Children were classified according to their height, standard height was taken as fiftieth percentile of Harvard standard for age. Significant association could not be established between IQ and height of children. Darrel, et al (1986) in a study of children observed that the IQ increased with increasing height.

In the present study it was seen that children of nourished group performed better than the malnourished group. IQ of malnourished children was found to decrease with the degree of malnutrition. On statistical analysis, the IQ level were found to be highly associated with nutritional status of children. Gupta et al (1975) observed that children from nourished group performed better as compared to malnourished group on the Stanford Binet test of intelligence. All the children in nourished group had their IQs more than 90. Puri et al (1984) observed that adequate quantity of good quality protein does enhance IQ. Kadam et al (1984) observed that if malnutrition is severe and occur early may result in reduced mental development. Chaturvedi et al (1987) observed that upper intellectual grade $IQ \geq 110$ were greater in ICDS sample of children who were better nourished. Srivastava et al (1988) observed in a study of school children, using Ravan coloured progressive matrices, that the median IQ of nourished children was found to be 112.5 and for malnourished children was 94.5. median IQ of malnourished children was found to be decrease with increase in the degree of malnutrition. Similar findings were reported by Sharma et al (1991).

In the present study, it was found that with higher levels of IQ, the percentage of children getting promoted was more and number of children failing decreased. A highly significant association was obtained between school performance of children and their IQ levels. Mullick et al (1991) also reported the similar findings.

Proper school sanitation will help in promoting health of the children studying in a school. In the present study it was observed that the municipal school like Basic D.C. Talpura and Arya Kanya Inter College were situated in insanitary surrounding. These schools were located in crowded area, near

public health hazards such as mosquito and fly breeding places, heavy traffic dust and other nuisance. In contrast, the convent schools which included Christ the King for boys and Kendriya Vidhalaya No.2 were located in sanitary surroundings away from traffic, noise, market, factory etc.

The building of convent schools were two storied and well maintained. There were adequate number of class rooms, administrative offices and a common room. In contrast, the municipal school building were single storied and not well maintained.

In convent schools class rooms were adequate in number with smooth flooring, free from dust, damp and noise windows, doors and ventilator were adequate in number. The rooms were well ventilated and lighted. Class rooms were provided with wooden furniture and there was an arrangement for artificial lighting such as bulbs and tube lights. In municipal schools class rooms were inadequate in number and faulty lighting, ventilation and improper sitting arrangement was there. Some of the classes were being conducted in open verandahs. There was no furniture for students and children used to sit on floor mats. There was no arrangement for artificial lights and fans.

Water supply of convent school was safe, continuous and well distributed by taps. The lavatories were clean, adequate and separate for boys and girls. Sources of water supply in municipal schools were from hand pump and stored water. The lavatories were not clean, inadequate in number, service type and there was no separate arrangement for boys and girls.

First-aid and emergency care facilities were available in convent schools. These schools had an doctor on call in case of emergency. School

doctor carried out regular health check-ups and maintained a health record of every child. Health education classes were held in these schools. In contrast, municipal schools had no facilities for emergency and first-aid. Facilities for recreation in the form of games, music, library, computer in convent school were available. But in municipal school such facilities were not available. Sundaram et al (1979) also reported the similar findings.

CONCLUSION AND RECOMMENDATIONS

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CONCLUSIONS

The present study was conducted with the objectives of assessing the health status of urban primary schools of Jhansi city. In addition an attempt was also made to study the school environment and school health programme. Following conclusions can be drawn from the present study.

Primary school of urban Jhansi was chosen as a study area. In each of four schools children aged 5-11 years were surveyed. All the information about the children and school environment were recorded on pretested individual schedules and school environment schedules respectively.

Out of 840 students, 453 students were examined from municipal schools and 387 children from convent schools. Out of total children surveyed 52.98 percent were male and rest of 47.02 percent were female. Children belonging to scheduled caste were 10.0 percent, backward caste 33.0 percent and others 56.90 percent. 80.36 percent of children in convent school belonged to other class as compared to 36.87 percent in municipal schools. Hindu children formed a majority (70.90 percent), rest of them belonged to muslim (21.92 percent) and other religion (7.14 percent). In municipal schools 38.85 percent children were muslim as compared to 2.06 percent in convent schools.

While observing literacy status of parents, 3.33 percent of fathers and 33.69 percent of mothers were illiterate. 60.92 percent of mothers and 5.51 percent of fathers in municipal schools were illiterate as compared to 1.80 percent mother and 0.78 percent fathers in convent schools.

Fathers of 48.09 percent children were in service/business, 22.02 percent were in agriculture and 28.93 percent were labourer/skilled worker. In convent school, 78.03 percent had fathers who were in service and 21.96 percent had fathers in business.

In the present study, 39.29 percent children were from social class I, 5.83 percent from social class II, 27.78 percent from social class III, 25.83 percent from social class IV and 7.26 percent children from social class V. Majority of the children in convent schools belonged to social class I (82.27 percent) whereas children studying in municipal schools belonged to social class III and IV (86.63 percent).

36.07 percent children had good personal hygiene, 29.97 percent had fair and 35.95 percent had poor personal hygiene. Personal hygiene was found to be very poor in children of municipal schools (66.66 percent) whereas children of convent school had good personal hygiene (78.29 percent).

Most of the children (61.90 percent) having vegetarian diet as compared to non-vegetarian diet (38.09 percent). This difference was found to be statistically significant.

75.23 percent had B.C.G. scar, 74.28 percent had immunized against Polio and D.P.T., 57.26 percent against measles, 0.24 percent against measles, mumps & rubella and 0.71 percent against Hepatitis B. Immunization status of children from municipal schools was unsatisfactory as compared to convent schools children.

The nutritional status of children from municipal schools was comparatively poor. The value of all anthropometric measurements – weight, height and mid-arm circumference were found to be lower in

municipal school children as compared to convent school children. Boys showed higher values than girls for same age in both types of schools. The mean values of weight, height and mid-arm circumference were higher than ICMR standards in both types of schools.

In municipal school children, signs of nutritional deficiencies showed a higher prevalence than convent school children and the difference was found to be statistically significant. Signs of vitamin A deficiency was observed in 4.62 percent of municipal schools children and 0.25 percent of convent school children. Clinical anemia was seen in 20.97 percent of municipal schools children and 14.99 percent of convent schools children. Total prevalence of vitamin C deficiency in the present study was 7.73 percent. Prevalence of vitamin C deficiency was 11.25 percent and 6.2 percent in municipal and convent school children respectively. Similarly signs of vitamin D deficiency were more in municipal schools children.

Morbidity pattern as observed clinically in the present study, it was seen that skin diseases were the commonest disorder (37.97 percent) followed by dental disorder (23.57 percent). There was higher prevalence of skin disease, diarrhoea, worm infestation, respiratory diseases, eye diseases in municipal school children as compared to children from convent schools. Speech and hearing defects were significantly more in municipal schools children.

Prevalence of behaviour problems was more in municipal school children (25.58 percent) as compared to convent school (14.7 percent). Nail biting in 10.81 percent, thumb sucking 4.85 percent and enuresis in 1.98 percent children of municipal school while prevalence of nail biting in 8.78 percent, thumb sucking in 1.80 percent and enuresis in 1.80 percent children of convent schools.

IQ for both boys and girls from municipal schools was lower than the children from convent schools. A significant association was established between IQ levels and education of parents, socio-economic status of children and their degree of malnutrition. Children with higher IQ performed better in schools.

Regarding school environment, municipal schools were located in over-crowded areas and were in poor state of maintenance with no adequate furniture and ill-ventilated rooms. The number of class rooms were insufficient. There were no proper lavatories and no provision for safe drinking water. There were no recreational facilities provided for children. No provision was made for first-aid and no classes held on health education. On the other hand, convent schools were well maintained with enough class rooms and lavatories. Furniture, ventilation and lighting was adequate recreational facilities were provided. There were first-aid facilities available in convent schools and they held classes on health education periodically.

RECOMMENDATIONS

Following recommendations are made in present study :-

1. Health examination of every child should be done before entering school and at a regular intervals.
2. Routine, special medical examination and referral by family or school physicians should be done.
3. Many screening procedures should be done at regular intervals because screening procedure can indicate, to some extent, the pupil's visual and hearing difficulties, heart diseases, posture conditions, nutritional deficiencies and speech problem.

4. Hearing and vision of schools children should be tested by teachers under their supervision.
 5. Non-formal education for primary school children on personal hygiene, basic care and functions of their body should be carried out regularly.
 6. A daily inspection of the child by the teachers for his personal hygiene and for any indication of communicable disease is required.
 7. Teachers should interact with parents regularly on issues regarding health of their child.
 8. Control of communicable diseases, safety promotion, first-aid and emergency care should be available in school.
 9. Mid day meals should be provided in schools.
 10. There should be provision of safe and wholesome water at a convenient place in schools.
 11. Garbage and waste should be disposed off regularly at a proper place.
 12. Class rooms should be of adequate size and properly ventilated.
 13. Class room furniture should be of proper size and adequate in number.
 14. There should be adequate quality of lighting and level of illumination in the class room.
 15. There should be a proper and clean lavatories for boys and girls separately.
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BIBLIOGRAPHY

BIBLIOGRAPHY

1. Agarwal KN, Manwani AH, Khadaja PC, Agarwal DK and Gupta S. (1970) : Physical growth of Indian school children. *Ind ped*; 7 : 3-10.
2. Agarwal DK, Upadhyay SK and Agarwal KN. (1989) : Influence of malnutrition on cognitive development assessed by piagetian tasks. *Acta paediatr scand*; 78 : 115-122.
3. Agarwal KN, Das D, Agarwal DK, Upadhyay SK and Mishra S. (1989) : Soft neurological Signs and EEG pattern in rural malnourished children. *Acta Ped Scand*; 78 : 873-878.
4. Agarwal KN. (1990): Effect of malnutrition and iron deficiency on mental functions and study of possible mechanism in animal model. *Proc Ind Natl Sci Acad*; B56 : 43-50.
5. Agarwal KN, Agarwal DK, Upadhyay SK and Singh M. (1991): Learning disability in rural primary school children. *Ind Jour Med Res*; 94 : 89-95.
6. Agarwal KN, Agarwal DK and Upadhyay SK. (1995): Impact of chronic undernutrition in higher mental functions in Indian boys aged 10-12 years. *Acta paed*; 84 : 1357-1361.
7. Agarwal KN, Agarwal DK, Kumar A and Upadhyay SK. (1998) : Sequelae of early undernutrition on reaction time of rural children at 11-14 years. *Ind Jour Med Res*; 107 : 98-102.
8. Agarwal M, Ghildiyal, R and Khopkar S. (1999): Health status of school girls from affluent population of Mumbai. *Ind Ped* ;36 : 75-78.

9. American standard Guide for school lighting. New York Illu: Eng. Soc. 1962 : 8-18.
10. American Association for Health, Physical Education, and Recreation (1962) : National conference for the professional preparation in Health Education, Physical Education, and Recreation Education Washington, DC, The Association : 42.
11. Amid LT, Brain AB and Janet AB. (1987) : Prevalence of dental caries and periodontal disease in Mexican American children aged 5-17 years: Results from south western HHANES 1982-1983. Amer Jour Pub Hlth ; 778 : 967-970.
12. Anastasi. (1958) : Heredity, environment, and the question "How ?" Psychological Review; 65 : 197-208.
13. Ann L, Griffen DDS, stephen J and Geopfred DDS. (1991): Preventive oral health care for infants, child and adolescent. Ped Clin N Amer ; 38 : 1209-1225.
14. Athavale V.B. (1959) : Medical examination of school children. Ind Jour child Hlth : 393-429.
15. Balasuriya S. and Fernan-Do M.A. (1986). Anthropometric study of school children in three district of Sri Lanka. Ceylon Med Jour; 31 : 21.
16. Balgir RS, Murmu B and Dash BP. (1998): Health and nutritional status of Ashram school children in the two distracts of Orissa. Ind Jour Nutr Dietet; 35 : 329-338.

17. Bapat MM and Aspatwar Ashok. (1992): Nutritional status of Pre-school & school children in slums of Bombay suburbs. *Ind Jour Nutr Dietet* ; 30 : 127-133.
18. Banik ND, Nayer S, Krishna R, Bakshi S, and Taskar AD. (1973): Growth pattern of Indian school in relation to nutrition and adolescence. *Ind Jour Ped*; 40 : 173.
19. Bhandari B, Jain AM, Karna P, Mathur A and Sharma VK. (1972): Nutritional anthropometry of rural school children of Udaipur district. *Ind Jour Ped*; 39 : 1.
20. Bhasin SK, Singh S, Kapil U, Sood VP and Gaur D R. (1990): Height and weight of well-to-do school children in Haryana. *Ind Ped*; 27 : 1089-1093.
21. Borle RM, Borle SR and Jawale SS. (1990): Incidence of dental disease and estimation of nutritional status in tribal school going children. *Jour Ind Dent Assoc*; 61: 218 -219.
22. Bhatia VP, Katiyar GP and Agarwal KN. (1979): Effect of intrauterine nutritional deprivation on neuromotor behaviour of the new born. *Acta Ped Scand* ; 68 : 561-566.
23. Champakam S. (1968) : Kwashiorkor and mental development. *Amer. Jour Clin Nutr*; 21 : 44.
24. Chandna S and Chawla TN. (1979) : Incidence of dental caries in Lucknow school going children. *Jour Ind Dent Assoc*; 51 : 109-110.

25. Chandna Sonia and Sehgal Salil (1994): Nutritional status of school children (7.9 years) - A comparative study of boys and girls. *Ind Jour Nutr Dietet* ; 31: 323-328.
26. Chandna U and Bhat CM. (1984) : Nutritive value of diets consumed by hostel girls at HU Hisar HAUJ. *Res* ; 14 : 415-424.
27. Chang KSF, Lee MCM, Low WD and Evan E. (1963) : Height and weight of southern Chinese children. *Amer Jour Phys Anthropol*; 29 : 497.
28. Chhabra P, Garg S, Sharma N and Bansal RD. (1996) : Health and nutritional status of boys Aged 6 to 12 years in a children observation home. *Ind Jour Pub Hlth* ; 40 : 126-129.
29. Chaturvedi S. (1987) : Impact of six years exposure to ICDS scheme on psycho-social development. *Ind Ped* ; 24 : 153-160.
30. Chaudhary KP, Chwala TN, Bhargava PS and Nanda RS. (1957) : Dental health survey of Lukhnow school going children. *Jour All Ind Dent Assoc* ; 29 : 199-205.
31. Chatterjee S and Mandal A. (1991) : Physical growth pattern for girls from rural west Bengal. *Ind Jour Med Res* ; 94 : 346.
32. Chatterjee Satipati and Mandal Anindita (1994) : Physical growth pattern for boys from rural west Bengal. *The Ind Jour Med Res* ; 99 : 184-191.
33. Cravioto J. (1971) : Application of Newer knowledge of Nutrition on physical and mental growth and development. *Amer Jour Pub Hlth* ; 53 : 1803-1809.

34. Cravioto J and De Licarde ER. (1973) : Effects of malnutrition on the individuals. In Berg A, Scrimshaw N and Call D. edited (1973) : Nutrition, national development and planning ; MIT press, Massachusetts : 1-21.
35. Darrell M and Wilson P. (1986) : Growth and intellectual development. *Ind Ped* ; 78 : 646-650.
36. Datta Banik ND, Bakshi S and Tasa Ral AD. (1973) : Growth pattern of Indian school children in relation of nutritional adolescence. *Ind Jour Ped* ; 40 : 173-177.
37. Datta Banik ND. (1982) : Semilongitudinal growth evaluation of children from birth to 14 years in different socio-economic group. *Ind Ped* ; 19 : 353-559.
38. Dhar SN, Sethi AS, Dhar GM, Rauf A and Qadiri MH. (1979): A study of health status of primary school children in Hazratbal (Kashmir). *Ind Jour Pub Hlth* ; 23 : 165-171.
39. Dhingra DC, Anand NK and Gupta S. (1977) : Health status of school children of various socio-economic groups. *Ind Ped* ; 16 : 103-106.
40. Dugdale AE, Chen ST and Hewitt G. (1970) : Patterns of growth and nutrition in childhood. *Amer Jour Clin Nutr* ; 23: 1280.
41. Dugdale AE and Eaton-Evans J. (1986) : Methods used in anthropometry and suggested international reference sets. Human nutrition research group, Department of child health. University of Queensland, Queensland, Australia.

42. Dutta A. (1965) : A study of prevalence of periodontal disease and dental caries amongst the school going children in Calcutta, Jour All Ind Dent Assoc : 367-384.
43. Dwivedi MP, Sharma SN and Chauhan VS. (1978) : A study of health status of primary school children in rural and urban areas. Jour of Ind Assoc Prev Soc Med ; 9 : 52-57.
44. Easwaran PP and Devadas RP, (1984) : Growth performance and secular trends among school children of Coimbatore. Ind Jour Nutr Dietet ; 21: 355-371.
45. Easwaran parvathi P and Poorani R. (1991) : Nutritional status of tribal school going children. Ind Jour Nutr Dietet ; 28 : 207-214.
46. Gallo P, Grassivaro M and Marrisa F. (1980) : Growth of children in Somalia. Human Biol ; 52 : 547-561.
47. Ganga N, Rajgopal B, Rajendra S and Padmonabhan AS. (1991). Dental caries in children. Ind Ped ; 28 : 415-416.
48. Gangadharan M. (1977) : School health service programme in kerala - A rural study, Ind Ped ; 14 : 603-613.
49. Ghani AR, Verma IC, Ghai OP and Seth V. (1971): Physical growth of school children in Delhi. Ind Ped ; 38 : 411.
50. Gill PS and Prasad BG. (1968): Dental health survey of Primary School children in rural area of Lucknow. Jour Ind Den Assoc : 227-232.

51. Gill PS, Prasad BG and Srivastava RN. (1969): Health status of Primary School children in rural area of Lucknow. *Ind Jour Ped* ; 35 : 314.
52. Gopalan C. (1992): Nutrition in developmental transition in South - East Asia. WHO Regional Health Paper. SEARO : 46.
53. Govt. of India (1946) : Report of Health Survey and Development Committee, Govt. of Ind. Simla.
54. Govt. of India (1961) : Report of the school Health Committee, Part I, Cent Hlth Edu Bureau, New Delhi.
55. Graham GC, Maclean WC Jr, Kallman CH, Rebold J and Mellits ED. (1979) : Growth standards for poor urban children in nutrition studies. *Amer Jour Clin Nutr* ; 32 : 703.
56. Gupta S, Dhingra DC, Singh MV and Anand NA. (1975) : Impact of nutrition on intelligent. *Ind Ped* ; 2 : 1079-1082.
57. Gupta PK. (1989) : Health status of rural school children : *Ind Ped* ; 26 : 581-584.
58. Hampill PV, Drizd TA, Johnson CL, Reed RB, Roche AP. and Moore VM. (1979) : Physical growth : National centre for Health statistics percentiles. *Amer Jour Clin Nutr* ; 32 : 607.
59. Hauspie RC, Das SR, Preece MA and Tanner JM. (1980) : A longitudinal study of the growth height of boys and girls of West Bengal aged 6 month to 20 years. *Amer Jour Hum Biol* ; 7 : 429.

69. Joseph MV. (1977) : Health problems in rural school children - A new look at them. *Ind Ped* ; 14 : 243-246.
70. Kadam SS. (1984) : Protein caloric malnutrition, brain development intelligence and behaviour. Post-natal nutrition. *Ind Jour Nutr Dietet* ; 21 : 69-78.
71. Kapil U, Manocha S and Bhasin S. (1993) : Dietary intake amongst 'well-to-do' adolescent boys and girls in Delhi. *Ind Ped* ; 30 : 1017-1019.
72. Kapoor G and Aneja S. (1992) : Nutritional disorders in adolescent girls. *Ind Ped* ; 29 : 969-973.
73. Karim R, Bhuyan, AH and Sukanta S. (1991) : Effect of nutrition on school performance in a primary school in Dhaka, Bangladesh. *Ind Jour Nutr Dietet* ; 28 : 171-176.
74. Kaul KK, Taskar AD, Madhavan S, Mukerji B, Parekh P, Sawhney K, Goel RK and Lamba IMS. (1976) : Growth in height and weight of urban Madhya Pradesh adolescents. *Ind Ped* ; 13 : 31.
75. Khan MU, Hassan AH, Abu Z, Ahmad F and Osama E. (1990) : Teething pattern and prevalence of dental caries. Factors influencing development of caries teeth. *Ind Jour Ped* ; 57 : 108-150, 109-113.
76. Koshi FT, Prasad BG, Jain VC and Vidya Bushan. (1970) : A study of health of primary school children. *Ind Jour Med Res* ; 58 : 12.
77. Krishna D, Visweswara Rao K and Reddy PJ. (1991) : Association of agro-economic and socio-demographic indicators and nutritional status of pre-school children. *Ind Jour Nutr Dietet* ; 28 ; 11-19.

78. Krishnaswamy K, Vijayaraghavan K and Shastry JG. (1997) : Twenty five years of National Nutrition Monitoring Bureau : National Institute of Nutrition, Indian Council of Medical Research, Hyderabad.
79. Kumar A, Jain AK, Mittal P and Katiyar GP. (1990) : Weight and height norms of 5-10 years old children of upper socio-economic status. *Ind Ped* ; 27 : 835-840.
80. Laske GS, Ripa LW, Leske MC and Schoeu MH. (1986) : Dental public Health. In Maxcy Rosenau Public Health and Preventive Medicine. Ed Last JM. Connecticut, Applenton. Castury Crafts : 1473-1513.
81. Levinson BM. (1959) : Traditional Jewish cultural values and performance on the wechsler tests. *Jour Edu Psycho* ; 50 : 177-181.
82. Levinson BM. (1961) : Sub-cultural values and IQ stability. *Jour Genet. Psycho* ; 98 : 69-82.
83. Malaviya KD, Sen Gupta JK, Srivastava RN. and Prasad BG. (1969) : Nutrition status of Primary school children in some schools in the area of the rural health training. Centre, Sarojini Nagar. *Ind Jour Pub Hlth*; 13 : 110-121.
84. Maier NRF. (1932) : the appraised interview : objectives, methods and skills, New York : Wiley.
85. Mathur HN, Jain TP and Jain ML. (1979) : Dental caries in school girls. *Ind Jour Ped* ; 46 : 43-48.

86. Mc Donald SP, Cowell CR and Sheikram P. (1981) : Methods of preventing dental caries used by dentists for their own children. *Br Dent Jour* ; 151: 118-121.
87. Merchant KH and Abraham N. (1975) : Medical examination of school children in Bombay city. *Ind Ped* : 557.
88. Mistry KM. (1983) : The changing pattern of oral disease in india. The need for a preventive approach. *Jour Ind Assoc*; 55: 387-393.
89. Mishra UK, Kalital J, Kumar S, Poptani H, Agarwal DK and Agarwal KN.(1996) : Brain MRI and cognitive evoked potentials in rural chronically undernourished children. *Nutr Res* ; 16 : 1147-1151.
90. Mukherjee PS and Sen Gupta SK. (1960) : Health status of School children in urban West Bengal. *Ind Jour Pub Hlth* ; 4 : 777-783.
91. Mullick H, Kumar Arun and Gupta SB. (1991) : Assessment of health status of urban primary school children of Jhansi (U.P). Thesis submitted to Bundelkhand University as partial fulfilment of MD. (Community Medicine).
92. Narang RL, Jain BK, Gupta MS and Gupta R (1991) : Spectrum of psychiatrics symptomatology in children in high socio-economic groups in Ludhiyana. *Ind Ped* ; 29 : 1489-1496.
93. Nariyama K and Goto E. (1988) : The study of relationship between sports and height growth in Japanese students during the last 20 years. *Amer Jour Hum Biol* ; 1 : 581.

94. National Facilities Conference, Planning Facilities for Health, Physical Education and Recreation (rev. ed.) Chicago: Athletic institute; 1956: 75.
95. Nelson WE. (1992) : Growth and development In : text book of pediatrics, 14th ed. Philadelphia : WB. Scaunder Co : 13-104.
96. Obry Musset AM, Cachén PM, Turlot JC, Baker B and Frank FM. (1991) : Dental Caries and oral hygiene among 12 year old children in Martinique, France, Community dental oral Epidemiology ;19 : 54-55.
97. Pal MK. (1966) : A study of health and defects observed amongst the school children in New Delhi. Ind Jour Pub Hlth ; 10: 3.
98. Parvati Easwaran P and Poorani R. (1991) : Nutritional status of tribal school going children. Ind Jour Nutr Dietet ; 28 : 207-214.
99. Patodi RK, Sharma SK and Patodi SK. (1977) : Health status of school children in some primary schools of Indore city (M.P). Ind Jour Pub Hlth ; 21: 71-77.
100. Prasad AP, Lakshmi AV and Bamji MS. (1987) : Riboflavin and haemoglobin status of urban school boys. Ind Jour Ped; 54 : 529-533.
101. Parizkova J. (1979) : Role of body dimension and body composition in physical fitness and performance during growth and adulthood coll. Anthropod ; 3 : 49.
102. Provis HS and Ellis RWD. (1955) : An anthropometric study of Edinburgh school children I. Methods, data and assessment of methods. Arch Dis Child; 30 : 328-333.

103. Puri R. (1984) : Impact of on ongoing supplementary feeding programme on the mental abilities of children. *Ind Jour Ped* ; 51 : 653-657.
104. Qamara SR, Mehta S and Deodhar SD. (1990) : A mixed longitudinal study of physical growth in girls. *Ind Ped* ; 27: 925-936.
105. Raghavan KV, Singh D and Swaminathan MC. (1971) : Height and weights of well nourished Indian school children. *Ind Jour Med Res* ; 59: 649-654.
106. Rana T, Raman L, Rau P and Visweswara Rao K. (1986) : Association of growth status and age at menarche in urban upper middle income group girls of Hyderabad. *Ind Jour Med Res* ; 84 : 522-530.
107. Rao KP, Singh S, Krishna P and Nayar S. (1984) : Health and nutritional status of rural primary school children. *Ind Ped* ; 21 : 777-783.
108. Rao SP and Bharambe MS. (1993) : Dental caries and periodontal disease among urban, rural and tribal school children. *Ind Ped* ; 30 : 759-764.
109. Rath B, Ghosh S, Mohan Man and Ramanujacharyula TKTS. (1978): Anthropometric indices of children (5-15 years) of a privileged community. *Ind Ped* ; 15: 653-665.
110. Rau P, Raman L and Visweswara Rao K. (1985) : Nutritional status and age at menarche. *Proc Nutr Soc India* ; 31 : 77-87.

111. Ray SC, Mazumdar K, Mukherjee PK and Das KK. (1971) : Health status of school children in Calcutta. Archives of child health ; 13 : 122.
112. Renu SK. (1990) : Nutritional status of Human female population with special reference to Iodine in Kangra Valley (H.P.) palampur India. Ind Jour Nutr Dietet; 19 :290-295.
113. Richard M. (1962) : A History of health education in the United States Philadelphia : Lea and febiger : 31-32
114. Rule JT. (1982) : Recognition of dental caries. Ped Clin North Amer ; 29 : 439-456.
115. Sarupriya S and Mathew S. (1988) : Nutritional status of tribal adolescents of village Gogunda, Rajasthan. Ind Jour Nutr Dietet;25 : 281-287.
116. School Health Committee (1961): School Health Committee Report I&II, Govt of India, New Delhi.
117. Shah PN and Udani PN. (1968) : Medical examination of rural school children in Palghur Taluk. Ind Jour Ped ; 5 : 343.
118. Sharma DK, Kumar S, Singh R and Agarwal GC. (1984): A study of health status of primary school children in urban area. Ind Jour Comm Med ; 9 : 5-11.
119. Sharma KVR, Vazir S, Rao DH, Sastry JG and Rao MP.(1991): Nutrition health and Psychosocial profile of institutionalised children Ind Ped ; 28 : 767-778.

120. Shetty PB. (1992) : School health programme in the Municipal schools of greater Bombay. IN : The girl child in India. Eds. Patnekar PN. Bhawe SY. Jayar AV, Potdar RD. Mumbai. Ind Acad Ped : 84-92.
121. Shetty HD and Meenakshi K. (1969) : Some anthropometric measurements in South Indian school boys. Ind Jour Nutr Dietet ; 30:290-295.
122. Singh G and Singh T. (1985) : Dental Caries. Ind Ped ; 22 : 849-852.
123. Singh HD and Meenakshi K. (1969) : Some anthropometric measurements in South Indian school boys. Ind Jour Nutr Dietet ; 30:290-295.
124. Singh Madhu B, Haldiya KR, Yadav SP, Lakshminarayana J, Mathur ML, Sachdeva R and Beniwal BK. (1996) : Nutritional status of school age children of salt workers in Rajasthan. Ind Jour Med Res ; 103: 304-309.
125. Sood Renu and Kochar GK. (1993) : Nutritional status of school going children of kangra Valley in Himachal Pradesh. Ind Jour Nutr Dietet; 30:290-295
126. Shrivastava BG, Chandra R, Shrivastava VK, Saxena SG, Nandan D and Gupta RP. (1981) : Prevalence of trachoma in school children of a rural community. Ind Ped ; 18:233-240.
127. Shrivastava DK, Thawreni VP and Gupta K. (1978) : Health examination of primary school children at Gwalior Part-III. Anthropometry assessment. Ind Ped; 15 : 671-679.
128. Shrivastava VK. (1988) : Nutrition and its impact on IQ of school children. Ind Jour Bio-Research ; 8 : 79-82.

129. Shrivastava RP, Shrivastava RN. (1990) : Oral cleaning habits of rural school going children in Jhansi. Jour Ind Dent Assoc ; 6 : 143-147.
130. Stuart HC, Stevenson SS. (1959) : Physical growth and development. In: text book of Pediatrics, 7thEd. Nelson WE. Philadelphia, WB. Saunders co : 12-61.
131. Sundaram VM. (1978) : Health profile of school children in Madras city. Ind Ped ; 15: 725-730.
132. Sundaram VM. (1979) : A study of school environment in Madras city. Ind Jour Ped ; 55 : 889-898.
133. Talim ST. (1983) : The problem of dental caries and periodontal diseases in India. Jour Ind. Dent Assoc ; 55: 395-399.
134. Tanner JM, Whitehouse RH and Takaishi M. (1966): standards from birth to maturity for height, weight, height velocity and weight velocity: British children-Part II, Arch Dis child ; 36 : 205.
135. Thakre S.(1989). An epidemiological study of orodental disease amongst school children in rural areas of Wardha district. Thesis submitted to Nagpur University as partial fulfilment of M.D. (community medicine).
136. Thomas M, Patnekar PN, Bhave SY, Jaykar AV and Potdar RD. (1992) : Nutritional status of girl child in India, Mumbai. Ind Acad Ped : 103-105.
137. Tragler AT. (1981): study of primary school health in Bombay Ind Ped ; 18 : 505-555.

138. Traeen B and jostein R. (1990) : Dental health behaviours in Norwegian population. *Comm Dent Hlth* ; 7 : 59-68.
139. Udani PM. (1963): Physical growth of children in different socioeconomic groups in Bombay. *Ind Jour Child Health* ; 12: 593.
140. Upadhayay SK, Agarwal KN and Agarwal DK. (1989): Influence of malnutrition on social maturity, visual motor coordination and memory in rural school children. *Ind Jour Med Res* ; 90 : 320-327.
141. Upadhayay SK, Agarwal DK and Agarwal KN, (1989): Influence of malnutrition on intellectual development. *Ind Jour Med Res* ; 90 : 430-441.
142. Upadhayay SK, Agarwal DK and Upadhayay AK. (1995): Persistence of soft neurological signs in chronic undernourished children. *Nutr Res* ; 15 : 193-199.
143. Vaish RP MDS (1982) : Prevalence of caries amongst school going tribal children in Gangam, District, Orissa. *Jour Ind Den Assoc* ; 54 : 375-377.
144. Vaish R. (1983) : Prevalence of caries among tribal school children in Phulbani district, Orissa. *Jour Ind Den Assoc* ; 55 : 455-457.
145. Venugopal T, Kulkarni VS, Nerurker RH, Damle SC and Patenkar PN. (1998) : Epidemiological study of Dental caries. *Ind Jour Ped* ; 65: 883-889.
146. Verma BL, Kumar Arun and Shrivastava RN. (1980) : Nutritional profile of children in rural community, finding of two Surveys. *Ind Jour Pub Hlth* ; 24 : 140-149.

147. Verma M, Joshi J and Bhatia J. (1986): Dental caries and Periodontal disease. A hospital based study. *Ind Ped* ; 26 : 166-168.
148. Verma P, Saini L and Gupta S. (1971): Nutritional Status of children in a welfare home. *Ind Ped* ; 8 : 499-506.
149. Victor CV. (1983) : Growth and development. In: Text book of pediatrics, 12th edn. Eds Behrman, RE, Vaughan, VC, Nelson WE. Philadelphia, WB. Saunders co : 30-38.
150. Vijayrathan K, Singh D and Swaminathan MC. (1971): Height and weight of well nourished Indian school children. *Ind Jour Med Res* ; 59: 648-654.
151. Vishwanathan KS. (1960): Organisation of school health programme. *Alum Assoc Bull Editorial*.
152. Visweswera Rao K. (1987): Vital statistics and nutritional status of Indian children. *Ind Jour Nutr Dietet* ; 24 : 272.
153. Visweswera Rao K and Balakrishna N. (1990) : Discriminant functions analysis : A case study of some socio economic constraints on child nutrition. *Ind Jour Med Res* ; 92 : 66-71.
154. Visweswera Rao K, Balakrishna N, Shatrugna V and Thimmayamma BVS. (1991): Body mass index in school age children and adolescents. *Ind Jour Phys Anthropol Hum Genet* ; 17: 113-124.
155. Wani BA. (1970) : Incidence and symptomatology of ascariasis in Kashmir, A thesis submitted to University for M.D. Medicine.

156. Waterlow JC. (1972): classification and definition of protein calorie malnutritions, Brit Med Jour ; 3:566.
 157. World Health Organisation (1972): Nutritional anaemia. WHO Tech Rep Ser : 503.
 158. World Health Organisation Report (1983): measuring change in nutritional status: WHO Geneva : 63-101.
 159. Yadav RJ and Singh Padam. (1999) : Nutritional status and dietary intake in tribal children of Bihar. Ind Ped ; 36 : 37-42.
 160. Yaima E, Chandras PH and Datta SN. (1981) : Morbidity pattern in urban school children. Ind Jour Pub Hlth ; 25: 42-46.
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APPENDICES

APPENDIX-I

HEALTH STATUS OF URBAN PRIMARY SCHOOL CHILDREN OF JHANSI

INDIVIDUAL SCHEDULE

1. S. No. : Name of School
2. Name of Child : Father's Name
3. Class : Sex: M/F
4. Age (In Years) : Date of Birth
5. Father's Education Status: Illiterate/Middle & Primary/Inter/High
School/Professional/Graduate.
6. Mother's Education Status: Illiterate/Middle & Primary/Inter/
High School/Professional/Graduate
7. Mother's Occupation : Service/Business/Agriculture/
Housewife/Labourer/Skilled
worker/Others Specify
8. Father's Occupation : Service/Business/Agriculture/
Labourer/Skilled worker/
Others Specify
9. Total Family Income :
10. Total no of family members Adult
- Children
11. Total no. of Siblings :
12. (A) Religion : Hindu/Muslim/others (specify)
- (B) Cast : Upper/Scheduled/Backward/ Others (Specify)

- | | | | | | |
|-------------------------|---|-------|-------|-------|---------|
| 13. Immunisation status | : | I | II | III | Booster |
| B.C.G. | : | .... |  |  |  |
| Polio | : | ..... | ..... | ..... | ..... |
| D.P.T. | : | ..... | ..... | ..... | ..... |
| Measles | : | ..... |  |  |  |
-
- | | | |
|---------------------------------------|---|---|
| 14. Personal Hygiene | : | Good/Fair/Poor |
| Hair | : | Dirty/clean |
| Nails | : | Cut/Uncut |
| Mouth/Teeth | : | clean/dirty |
| Bathing | : | Daily/Irregular |
| Ears | : | Clean/Dirty |
| Clothing | : | Clean/Dirty |
| Foot Wear | : | Clean/Dirty |
| Ablution | : | Hand washing-soap/soil/water |
| 15. Food Habits | : | Vegetarian/Non Vegetarian |
| 16. History of past illness | : | |
| H/o passing worms | : | |
| 17. Present complaints with duration: | | |
| 18. Physical Examination | | |
| A. General Examination | : | |
| Posture | : | Normal/Kyphosis/Scoliosis/ Flat feet |
| Skin | : | Normal/Dry/Follicular Hyperkeratosis
/Petichial/Pellagrous dernatosis
/Phrynoderma. |
| Scabies | : | Present/Absent |
| Furunculosis | : | Present/Absent |
| Tinea & Fungus | : | Present/Absent |

Leprosy	:	Present/Absent
Others (Specify)	:	
Hair	:	Normal/Dull and Dry/Dyspigmented/ Thin & Sparse/Easily Pluckable/Flag Sign.
Clinical Anemia	:	Present/Absent
Eyes	:	Normal/Impaired.
Vision	:	
Vision without glasses	:	
Vision with Glasses	:	
Congenital Anomalies	:	Squint/Epicanthus/Corneal opacity /Ptosis/Colour Blindness/None.
Signs of Vitamin A	:	Night blindness/Conjunctival Xerosis /Corneal xerosis/Bitot's spot/Keratomalacia/None.
Trachoma	..	Present/Absent
Conjunctivitis	:	Present/Absent
Others (specify)	:	
Glands	:	
Thyroid	:	Normal/Enlarged
Parotid	:	Normal/Enlarged
Cervical Lymph Nodes	:	
Others (specify)	:	
Nails	:	Normal/Koilonychia/Transverse Ridging
Oedema	:	Present/Absent
	:	(specify)

Rachitic Change : Knock knees/Bowlegs/Epiphyseal
Enlargement/ Beeding of Ribs/Pigeon
Chest/Nose.

- B. Systemic Examination :
- Respiratory system :
- Cardiovascular system :
- Gastro-Intestinal system :
- Hepatomegaly : Present/Absent
- Splenomegaly : Present/Absent
- Others (specify) :
- Gentio-Urinary system :
- Ears :
- Hearing : Normal/Impaired
- Otorrhoea : Present/Absent
- Lips : Normal/Red & Raw/Fissured/
Geographic/Atrophic Papillae.
- Speech : Normal/Stammering/lalling/staccato/
Slurring.
- Gums and Teeth : Normal/Mottled enemel/Enemel
hypoplasia/Enemel errosion/Filled/
Missed/Malocclusion.
- Central Nervous system :
- Skeletal system :
21. Social and Emotional Health:
- Thumb Sucking : Present/Absent
- Nail Biting : Present/Absent
- Bed wetting : Present/Absent

- Backwardness in studies : Present/Absent
22. IQ
23. Anthropometric Measurements:
- Height : cms.
- Weight : Kgs.
- Mid Arm circumference : Cms.
24. Laboratory Investigation :
- stool test :
25. Diagnosis if any :
- Field notes :

SIGNATURE OF INVESTIGATOR

II KEY TO SCORING OF PERSONAL HYGIENE

Level of personal hygiene has been assessed by the following scoring scoring method.

Maximum marks : 16

- | | | | | |
|----|-------------|---|------------|---------------|
| 1. | Hair | : | clean - 2, | Dirty - 0 |
| 2. | Nail | : | cut - 2, | uncut - 0 |
| 3. | Mouth/teeth | : | clean - 2, | Dirty - 0 |
| 4. | Bathing | : | Daily - 2, | Irregular - 1 |
| 5. | Ears | : | clean - 2, | Dirty - 0 |
| 6. | Clothing | : | clean - 2, | Dirty - 0 |
| 7. | Foot - wear | : | clean - 2, | Dirty - 1 |

1. Washing of hands after toilet : 2

With soap – 2, with soil – 1, with water – 1, None – 0.

<u>Status</u>		<u>Marks</u>
Good	:	14-16
Fair	:	8-13
Poor	:	Less than 8

APPENDIX - II

HEALTH STATUS OF URBAN PRIMARY SCHOOL CHILDREN OF JHANSI.

SCHOOL ENVIRONMENT SCHEDULE

1. S.No :
2. Name of school :
3. Type : Hindi Medium/English Medium
4. Location of school :
5. Site of school :
6. Total no of children :
7. Environment surrounding : Hygienic/Unhygienic
8. Structure : Single storeyed/Double storeyed
9. Average size of class room : Sq. meter
10. Total no of children in :
class room
11. Distance of black board :
from seats
12. Type of furniture in class :
room
13. Ventilation of class room :
 - (a) Total no of windows :
 - (b) Distance of windows :
from floor
 - (c) Cross ventilation : Present/Absent
 - (d) No of Ventilators :

APPENDIX - II

HEALTH STATUS OF URBAN PRIMARY SCHOOL CHILDREN OF JHANSI.

SCHOOL ENVIRONMENT SCHEDULE

1. S.No :
2. Name of school :
3. Type : Hindi Medium/English Medium
4. Location of school :
5. Site of school :
6. Total no of children :
7. Environment surrounding : Hygienic/Unhygienic
8. Structure : Single storeyed/Double storeyed
9. Average size of class room : Sq. meter
- 10 Total no of children in :
class room
11. Distance of black board :
from seats
12. Type of furniture in class :
room
13. Ventilation of class room :
 - (a) Total no of windows :
 - (b) Distance of windows :
from floor
 - (c) Cross ventilation : Present/Absent
 - (d) No of Ventilators :

- (e) No of doors :
- (f) Ventilation : Adequate/Inadequate
14. Colour of wall of class :
Room
15. Lighting of class room :
sufficient natural light : Present/Not present
16. Water supply :
(a) Safe/Unsafe
(b) Continuous/Not continuous
(c) Water distributed by taps : Yes/No.
(d) Any other source than taps:
17. Eating Facilities
(a) Mid – day Meals : Provided/Not Provided
(b) Vendors : Allowed/Not allowed
18. Lavatory :
(a) Urinals : No
Type
(b) Latrines : No
Type : Septic tank/Services/Hand flush
(c) No of Lavatories for girls:
(c) No of Lavatories for boys:
19. Playground : Yes/No
20. First aid and emergency care facilities: Available/Not available
21. Facilities of Recreation : Available/Not available
22. Health education classes : Held/Not held

SIGNITAURE OF INVESTIGATOR
